

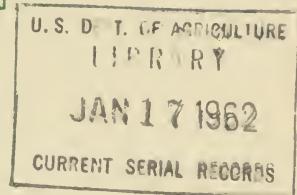
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# AN ECONOMIC ANALYSIS OF FAR EASTERN AGRICULTURE



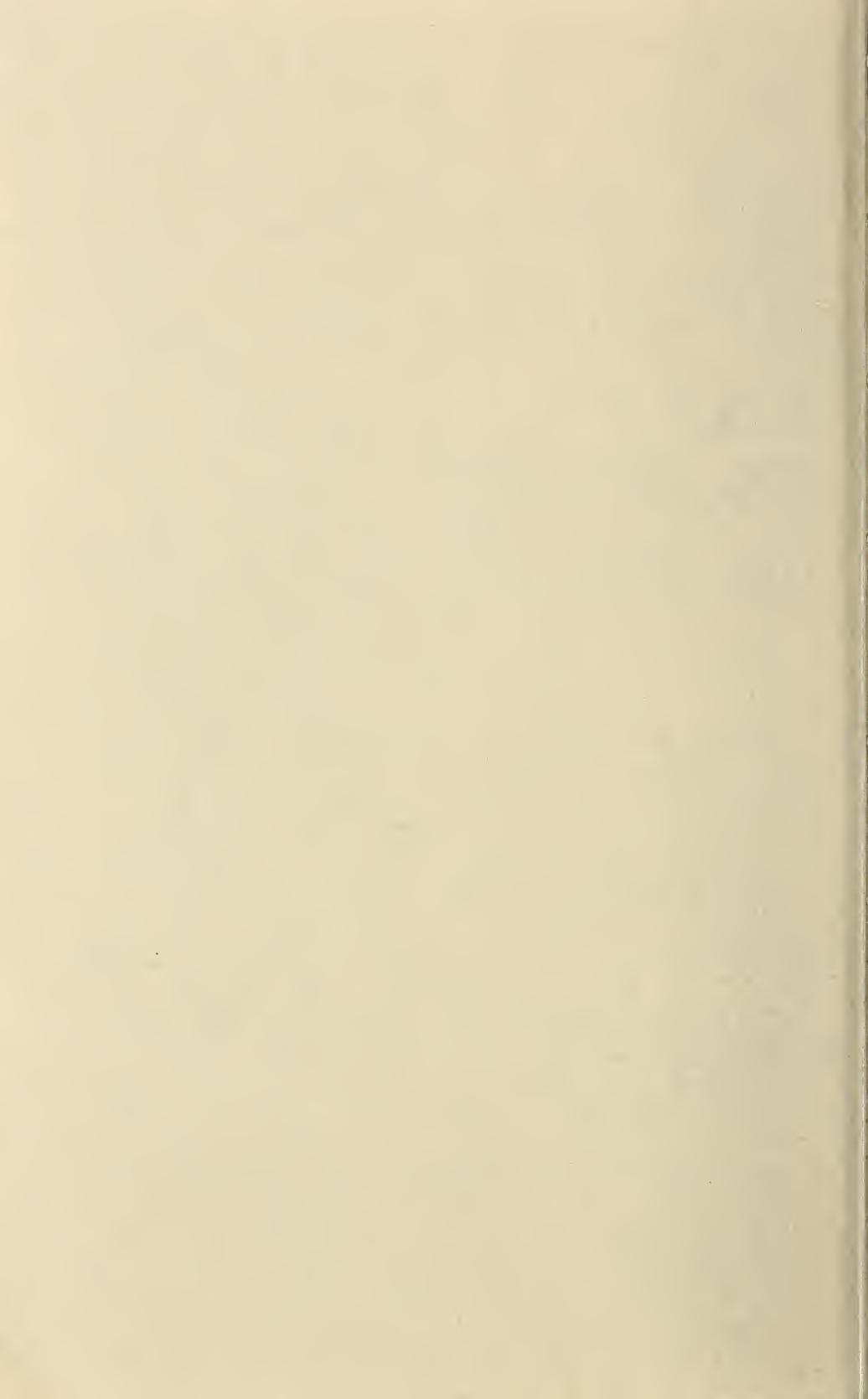
Foreign Agricultural Economic Report No. 2

UNITED STATES DEPARTMENT OF AGRICULTURE

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## Preface

The economic development of the Far East, with its population comprising over half of the people of the world, is critically important. Agriculture, the mainstay of Far Eastern economies, is of strategic concern, for both political and economic stability are contingent upon an adequate supply of food and fiber.

This publication discusses the critical relationship between population and land. It presents an analysis of the agricultural production pattern of the Far East over the past quarter century. Also presented is a breakdown of the present food consumption pattern in terms of both quantity and calories by commodity for the region and for individual countries. Considerable attention is given to the importance of agricultural trade of each of the countries and especially in respect to their agricultural trade relationships with the United States.

This publication does not include detailed analyses of agricultural production, food consumption, or agricultural trade of individual countries. Rather it discusses these matters for each country broadly in a world context.

Although political differences have sharply divided the geographic Far East, economic, social, and cultural similarities make it advisable to combine Free World and Communist Bloc countries whenever statistics on the Bloc countries are available. Analyses and comparisons have sometimes suffered from a lack of reliable data, especially from the Communist countries. It is hoped that this study, by its very nature, will serve to point out some of the weaknesses in current statistics, and by so doing, provide a step to future improvement.

**The FAR EAST, as used in this report, is that geographic area beginning with Afghanistan and Pakistan in the west and including Japan in the east. It is bounded on the north by the Soviet Union and stretches south to include the insular countries of Ceylon and Indonesia. (Figure 1.)**

## Contents

	Page		Page
Preface .....	i	Wheat .....	27
Summary .....	1	Corn .....	28
Economic Setting .....	3	Barley .....	29
Income levels .....	3	Oilseeds .....	29
Agriculture in the economy .....	4	Peanuts .....	29
Nonexchange nature of economies .....	4	Soybeans .....	29
Population .....	4	Coconuts .....	29
In a world context .....	4	Fibers .....	30
Distribution .....	5	Cotton .....	30
Country totals and rates of growth .....	6	Jute .....	30
Population projected .....	6	Silk .....	30
Physical Setting .....	7	Sugar .....	30
Location and area .....	7	Tea .....	30
Topography .....	8	Pepper .....	31
Climate .....	8	Tobacco .....	31
Agricultural Land .....	9	Rubber .....	31
Distribution .....	9	Peasant and Plantation Agriculture Compared .....	31
By country .....	9	Agricultural Trade .....	32
By farm .....	9	Trade in retrospect .....	32
Multiple cropping index .....	10	Importance of agricultural trade .....	32
Irrigation .....	11	The current export pattern .....	33
Fertilization .....	14	The current import pattern .....	33
Reclamation potential .....	15	Trade with the United States .....	35
The Agricultural Production Pattern .....	15	Exports to U.S. .....	35
The production pattern in retrospect .....	15	Imports from U.S. .....	40
The present production pattern .....	17	Competition with the United States .....	41
Determinants of the production pattern .....	17	Hongkong and Singapore: Entrepôt markets .....	41
The role of livestock .....	19	Gold and foreign exchange holdings .....	41
Agricultural Production Trends .....	21	Food Consumption .....	42
Production trends by country .....	21	Levels of consumption .....	42
Per capita production trends by country .....	22	Consumption pattern .....	44
Agricultural Productivity .....	22	The shifting consumption pattern .....	44
Production per acre .....	22	Agriculture in the Future .....	45
Production per person .....	24	Consumption .....	45
Review of Commodities .....	24	Production .....	47
Grains .....	24	Future Trade Prospects .....	49
Rice .....	24	References .....	50

## List of Figures

Figure	Page	Figure	Page
1. Map of Far East .....	iv	4. Far East: Production of major world agricultural commodities, 1959-60 .....	25
2. Far East: Indices of agricultural production, total and per capita .....	21	5. Far East: Rice yields per acre, average 1957-59 .....	26
3. Far East: Value of agricultural production per acre of cultivated land, average 1957-59 .....	23	6. Far East: Food consumption pattern compared with that of the United States, 1958 .....	45

## List of Tables

Table	Page	Table	Page
1. Agricultural production, total and per capita, by regions, valued at world market prices, 1958 .....	2	17. Far East: Annual agricultural production per capita, total population and rural sector, valued at 1958 world market prices, by country, average 1957-59 .....	26
2. Far East: Selected economic indicators for Free World countries .....	3	18. Free World countries of the Far East: Summary of agricultural production by commodities, average 1935-39, 1952-54, and annual 1957-60 .....	27
3. Far East: Population 1960, projected to 1975, annual rate of growth, and rural share of total population, by country ..	5	19. Free World countries of the Far East: Indices of agricultural production by commodity, average 1935-39, 1952-54 and annual 1957-60 .....	28
4. Far East: Relationship between population, agricultural production, and agricultural land, by country, 1960 ..	7	20. Far East: Value of total trade and agricultural trade, by country, 1958 .....	33
5. Far East: Selected statistics on agricultural land, by country, 1959 .....	10	21. Far East: Summary of principal agricultural exports by country and commodity, 1958 ..	34
6. Far East: Number and average size of farms, by country, 1959 .....	11	22. Far East: Selected agricultural export trade relationships, by value, by country, 1958 .....	35
7. Far East: Agricultural land, multiple cropping index, planted area and irrigated area by country, 1959 .....	12	23. Far East: Summary of principal agricultural imports by country and commodity, 1958 ..	36
8. Far East: Annual consumption of chemical fertilizer in terms of plant nutrients, by country, 1958-59 .....	13	24. Far East: Selected agricultural import trade relationships, by value, by country, 1958 .....	37
9. Far East: Average per acre application of plant nutrients, by country, 1958-59 .....	14	25. Far East: Value of total agricultural trade and agricultural trade with the United States by country, 1958 .....	37
10. Free World countries of the Far East: Production of specified agricultural commodities as percent of total value of agricultural production, average 1935-39, 1952-54 and annual 1957-60 .....	16	26. Far East: Summary of principal U.S. agricultural imports by commodity and country of origin, 1958 .....	38
11. Far East: Agricultural production pattern by major commodities for Free World countries, 1960 .....	18	27. Far East: Summary of principal U.S. agricultural exports by country of destination and commodity, 1958 .....	39
12. Far East: Food commodities and nonfood commodities as percent of total agricultural production, by country, 1960 ..	19	28. Far East: U.S. agricultural exports under Title I, Public Law 480 and total, by country, 1958 .....	40
13. Far East: Number of cattle, hogs and sheep by country, 1958 .....	20	29. Far East: Gold and foreign exchange holdings of selected countries, in millions of dollars, 1952-60 .....	42
14. Far East: Indices of agricultural production, by country, average 1935-39, 1952-54 and annual 1957-60 .....	23	30. Far East: Per capita annual food consumption levels by food groups for selected countries, 1958 .....	43
15. Far East: Indices of per capita agricultural production, by country, average 1935-39, 1952-54 and annual 1957-60 ..	24	31. Far East: Percentage distribution of food consumption in calories by food groups for selected countries, 1958 .....	46
16. Far East: Annual agricultural production per acre of agricultural land, valued at 1958 world market prices, average 1957-59 .....	25	32. Far East: Per capita cultivated land in 1959 and projected to 1975 .....	47

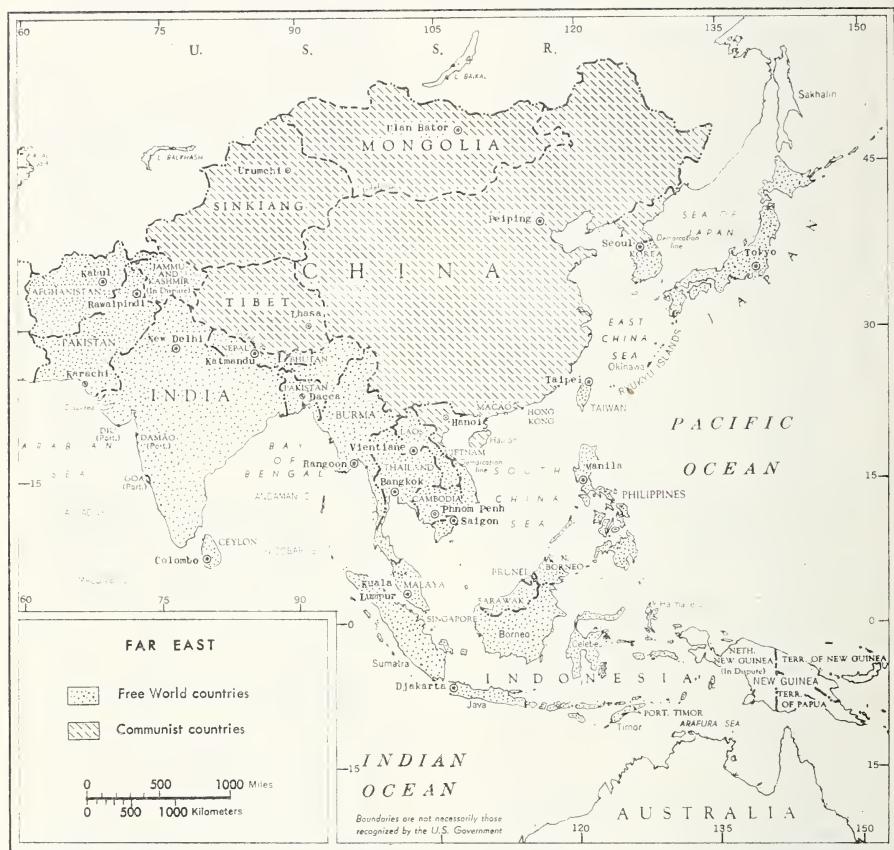


Figure 1

# AN ECONOMIC ANALYSIS OF FAR EASTERN AGRICULTURE

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## Summary

The Far East contains 53 percent of the world's people but it accounts for only 32 percent of agricultural production. In several important agricultural commodities it is the major source of output; it produces 90 percent or more of the world supply of rice, tea, jute, spices, and rubber.

The generally low per capita food and fiber production is further aggravated by low income levels. Per capita income in most of the countries averages less than 5 percent of that in the United States and the aggregate income of the region's 1.5 billion people is less than two-fifths that of the U.S. population.

Every economy in the area is an agrarian economy except Japan. Agriculture is the center of all economic activity; it is the largest source of production and it earns most of the sorely needed foreign exchange. Further, much of the commerce and light industry, especially the milling and processing industries, is based on agricultural products.

The area now has slightly over one-half the people of the world, and this share is steadily rising because the rate of natural increase is more rapid than that of the remainder of the world. The Far East is the only region of the world with both a high rate of population growth and an already dense population. The number of people to be added to the population between 1960 and 1975 will easily outnumber the current population of the Western Hemisphere.

The agricultural land area in

the Free World countries is nearly double that of the Asian Communist countries. This advantage is largely offset, however, by the higher index of multiple cropping and greater irrigated area in the Communist countries. Fertilizer consumption is concentrated in Japan which uses as much fertilizer on 13 million acres of cultivated land as all the remaining countries use on 822 million acres. Centuries of habitation and the accompanying exploitation of the cultivable land have left little land for reclamation.

Rice accounts for about 40 percent of all agricultural production on a value basis. All food grains considered aggregately comprise 58 percent of the total. Food commodities account for 86 percent of agricultural output leaving only 14 percent for nonfood commodities. An analysis of the agricultural production pattern over the last quarter century shows that it has remained remarkably constant although a very slight trend in the increase of food commodities at the expense of nonfood commodities is evident.

The production of food and fiber has risen about 3 percent annually during the last decade. With population gaining only 2 percent annually, the amount produced per capita has gained about 1 percent per year.

Production per acre is highest in those countries where population pressure is greatest. These are also the countries in which capital inputs are highest, irrigation is most extensive, and multiple cropping is most common.

Production per person, surprisingly enough, is often higher in those countries where per capita land availability is lowest.

If Japan—the only industrialized country—is excluded, agricultural exports earn two-thirds of the region's foreign exchange. Two commodities—rubber and tea—both nonfood items, account for nearly one-half of agricultural exports. Rice, the third ranking agricultural export, is largely confined to intraregional trade channels. The next 3 commodities—copra, sugar, and jute—go mostly to destinations outside the area. Wheat, cotton, and rice, the three leading agricultural imports, each account for about one-sixth of all agricultural imports. The United States is both the largest market for, and the leading supplier of, agricultural commodities to the Far East. Rubber and sugar represent well over one-half of U.S. agricultural imports from the

area and wheat and cotton comprise nearly two-thirds of agricultural exports to the area.

The level of consumption for the Far East, averaging 2,100 calories per capita daily, is lower than for any other region of the world and well below the 2,300 Food and Agriculture Organization minimum recommended level. Grain products supply 66 percent of the calories and high protein animal foods only 10 percent. Comparable figures for the U.S. consumption pattern are 23 percent and 36 percent respectively.

In the future, agriculture production will likely make consistent gains and remain abreast of population growth. It is not, however, likely to increase fast enough to accommodate both population growth and rising incomes. The sizable current flow of food grains from temperate North America and Australia will likely expand in the years and decades ahead.

TABLE 1.—*Agricultural production, total and per capita, by regions, valued at world market prices, 1958*

Region	Production		Population		Production per capita
	Million dollars	Percent of total	Millions	Percent of total	
Australia and New Zealand.	3,775	2.3	12	0.4	315
United States.....	26,475	15.8	174	6.1	152
Canada.....	2,550	1.5	17	.6	150
Western Europe.....	26,275	15.7	300	10.6	88
Latin America.....	15,275	9.1	194	6.9	79
Soviet Union.....	16,550	9.9	209	7.4	79
Eastern Europe.....	7,350	4.4	116	4.1	63
Western Asia.....	4,100	2.4	75	2.6	55
Africa.....	11,350	6.8	245	8.7	46
Far East <sup>1</sup> .....	53,500	32.1	1,490	52.6	36
World.....	167,100	100.0	2,832	100.0	59

<sup>1</sup> Includes all major countries in the Far East except North Korea and North Vietnam.

## Economic Setting

### Income Levels

Per capita income levels are abysmally low in nearly every country in the Far East. On the average they are less than 5 percent of those of the United States. Incomes in the region are lower than in any other region with the possible exception of Africa.

In 1958, the aggregate value of all goods and services (GNP) produced by the 16 leading Free World countries in the Far East amounted to only \$86.5 billion, or

less than one-fifth that of the United States. New York State, with a population of 17 million, produces more goods and services than India with its more than 400 million people. The combined gross national product of the Far East Free World and Communist countries—containing more than one-half the world population—is only two-fifths that of the United States.<sup>1</sup>

The above relationship is significant because when incomes are low, purchasing power is also low.

TABLE 2.—*Far East: Selected economic indicators for Free World countries*

Country	Gross national product 1958 <sup>1</sup>	Agricultural share of GNP	Per capita GNP 1958	Rate of economic growth 1955-59 <sup>2</sup>
	<i>Billion dollars</i>	<i>Percent</i>	<i>Dollars</i>	<i>Percent</i>
Afghanistan.....	.635	72	48	<sup>5</sup> +2
Burma.....	1.09	43	53	+4
Cambodia.....	.44	50	95	<sup>4</sup> +5
Ceylon.....	1.22	58	130	+3
India.....	30.3	50	75	+4
Indonesia.....	5.15	50	59	-2
Japan.....	27.75	22	302	+7
Korea, South.....	2.225	42	98	+5
Laos.....	.1	n.a.	50	n.a.
Malaya, Fed. of.....	1.635	40	250	<sup>6</sup> -1
Nepal.....	.451	85	51	<sup>8</sup> +5
Pakistan.....	5.055	60	62	<sup>9</sup> +3
Philippines.....	5.23	35	218	+5
Taiwan.....	1.09	31	104	+5
Thailand.....	2.19	44	102	+3
Vietnam, South.....	1.92	n.a.	152	+2
Total or average.....	86.481	.....	107	+4
(United States).....	(444.2)	(6)	(2,538)	(+4)

<sup>1</sup> 1960 prices.

<sup>2</sup> 5-year period from beginning of 1955 through end of 1959.

<sup>3</sup> Includes forestry and fishing.

<sup>4</sup> 4-year period from beginning of 1957 through end of 1960.

<sup>5</sup> 4-year period from beginning of 1956 through 1959.

<sup>6</sup> 3-year period from beginning of 1956 through end of 1958.

<sup>7</sup> Includes forestry.

<sup>8</sup> 2-year period from beginning of 1958 through end of 1959.

<sup>9</sup> 2-year period from beginning of 1959 through end of 1960.

<sup>1</sup> GNP of Asian Communist countries is estimated.

When incomes are low, a self-subsistence economy predominates and the law of comparative advantage cannot function well. This is a hindrance to both the developed and underdeveloped countries.

India outranked Japan in terms of total GNP in 1958 but only because of its vastly greater population. Japan, with its faster rate of growth, will likely have surpassed India by the end of 1961. The Japanese economy is the most viable economy in the area and in a world context its rate of growth is paralleled only by West Germany's.

The prevailing low incomes are further aggravated by the uneven distribution of income. As in most countries of the world, per capita incomes in the agricultural sector are well below those in the non-agricultural sector.

On the basis of per capita GNP, only seven countries exceed \$100. The Philippines and Malaya exceed \$200, while Taiwan, Thailand, South Vietnam, and Ceylon exceed only \$100. In Japan, the only large country in this group, per capita gross national product has recently passed the \$400 mark.

### **Agriculture in the Economy**

With the single exception of

Japan, every country in the area is an agrarian economy. Most of the economic activity—employment, production, commerce, industry, and exports—revolves about agriculture. The great need for food tends to obscure other problems.

The agricultural sector accounts for about one-half of the gross national production in most countries. Notable exceptions are Afghanistan, Nepal, and probably Laos, where it is three-fourths or more, and Japan, Taiwan, and the Philippines, where it ranges between one-fifth and two-fifths.

In the early stages of economic development, agriculture is the source of the capital required for industrialization and it earns the much needed foreign exchange. Any real widespread gains in raising production and income must begin in the agricultural sector.

### **Nonexchange Nature of Economies**

The nontransaction (subsistence) nature of many Far Eastern economies is rather characteristic of underdeveloped countries. Production is low and confined largely to the food staple or staples of the area; transportation is poor and the distribution system is limited.

### **Population**

#### **In a World Context**

If the outstanding problem of the Far East were to be expressed in two words, those words would be—population pressure. The problem of too many people and too little land is common to most of these countries and chronic in many. Well over half of the world's people reside in the Far East but it has only a small part of the world's land area. In terms of other production requisites such as capital and technology, it

is even less favorably endowed.

The Far East is unique among the regions of the world in that it is the only region with both a high density of population and a rapid rate of population growth. Europe has a high density of population but a relatively low rate of natural increase. Latin America has a high rate of population growth, but it is sparsely populated and possesses extensive undeveloped areas.

The age composition of the pop-

ulation with over 40 percent of all people under 15 years and less than 6 percent over 60, compares with that of Africa and Latin America. It contrasts with that of North America, Europe, and Oceania where the percentage under 15 years is 30 or less and that over 60 is 11 percent or more. The relatively young population of the Far East reflects both a generally shorter life expectancy and the recent rapid decline in infant mortality rate.

### Distribution

Concentrations of population throughout the world tend to coin-

cide either with manufacturing centers or rice growing areas. In the Far East, where manufacturing centers are not numerous, population concentrations correspond rather closely with rice growing areas. The high calorie return per acre of land from rice and the favorable storage characteristics of rice, even under humid conditions, underlie its strong population supporting capacity.

The people of the Far East are concentrated in the river valleys and on the river flood plains where an abundance of water makes the widespread cultivation of rice possible. Rainfall is undoubtedly the

TABLE 3.—*Far East: Population 1960, projected to 1975, annual rate of growth, and rural share of total population, by country*

Country	Population 1960	Projected to 1975 <sup>1</sup>	Estimated current annual rate of growth	Rural share of total population
	<i>Million</i>	<i>Million</i>	<i>Percent</i>	<i>Percent</i>
<b>Free world countries:</b>				
Afghanistan.....	13.5	16.9	1.0	90
Burma.....	22.1	27.4	2.4	70
Cambodia.....	4.9	6.4	2.2	85
Ceylon.....	9.9	14.1	3.0	60
India.....	425.0	563.0	2.3	72
Indonesia.....	91.9	122.0	2.3	80
Japan.....	93.6	116.0	1.0	37
Korea, South.....	23.7	32.2	2.7	70
Laos.....	2.2	2.6	1.5	95
Malaya, Fed. of.....	6.9	10.2	3.4	67
Nepal.....	9.3	13.1	1.5	90
Pakistan.....	88.9	128.0	2.3	67
Philippines.....	27.8	34.1	3.2	60
Taiwan.....	11.2	15.6	3.6	57
Thailand.....	25.5	32.1	2.8	84
Vietnam, South.....	14.1	19.1	2.0	75
Total or average.....	870.5	1,152.8	.....	69
<b>Communist countries:</b>				
China, Mainland.....	*669.0	894.0	*2.5	86
Korea, North.....	*8.0	10.8	2.0	70
Vietnam, North.....	*15.0	21.3	2.5	90
Total or average.....	692.0	926.1	.....	86
Grand total or average....	1,562.5	2,078.9	.....	76

<sup>1</sup> U.N. population projections—medium assumptions.

<sup>2</sup> Adjusted upward from U.N. figures on the basis of more recent information.

<sup>3</sup> Population for 1958.

<sup>4</sup> Population for 1959.

principal determinant of distribution. Where rainfall is heavy, population is usually dense and conversely where rainfall is light population is sparse. The vast, virtually uninhabited regions are largely the areas covered by the Thar Desert of Pakistan and India and the Gobi Desert of China. After rainfall, temperature is the next consideration. The more northerly regions, where temperatures are generally lower, have a shorter growing season and a lower population-supporting capacity.

The sparse population of the vast Himalayan plateau is attributable to the low temperature, low rainfall, and rarefied atmosphere of the high altitudes. This plateau, often called the rooftop of the world, is centered in Tibet and Nepal but it is also common to India, Pakistan, and western China.

As transportation, commerce, and industry develop, the population distribution may change for it will not be so necessary to have people and producing areas together. At present almost every country is preponderantly rural but as development programs progress, this too will change. Japan, with only 37 percent of its citizenry classified as rural, represents the only instance where less than half of the people are rural. The average for the Free World is 69 percent but in some isolated countries it may be 90 percent or more. The percent classified as rural in the Communist countries is 86 percent—much higher than in the remainder of the Far East.

#### **Country Totals and Rates of Growth**

India, among the Free World countries, and China, among the Asian Communist countries, dominate the Far Eastern scene as far

as population is concerned. The Free World countries, with an aggregate population of 832 million in 1959, have a slight edge over the Asian Communist countries which have only 692 million people.

Two countries in the Far East—Mainland China and India—contain over one-third of all the people in the world. On a worldwide basis Japan ranks fifth behind the Soviet Union and the United States. It is closely followed by Indonesia and Pakistan in sixth and seventh places respectively. Five of the seven most populous countries in the world are in the Far East. Japan with its unusually low growth rate of 1 percent annually will likely relinquish its fifth place world ranking, as it is bypassed by both Indonesia and Pakistan.

Information from recent censuses and surveys shows that many countries have been underestimating both total population and growth rates. When official figures are adjusted to allow for recent findings the population for the region may well be increased by several million.

#### **Population Projected**

The Far East's share of world population, now over one half, will likely increase, as its population is growing faster than that of the remainder of the world. Projected gains for the area between 1961 and 1975 will easily outnumber the current population of the western hemisphere. Mainland China, with an annual increase of 12-15 million, is faced anew each year with the prospect of supplying food for an increment the size of Australia's entire population. Given the declining availability of arable land, this is not a pleasant prospect. The somewhat lower growth rate of the Free World countries might operate to their

long-term advantage as the man-land ratio becomes even more critical.

Countries with rates of growth of 2 percent annually will double their present population in 35 years but those expanding at 3 percent per year must face the

same prospect in only 24 years. Even allowing for a considerable broadening in the application of technology and a step-up in capital inputs, the impact of population growth will be staggering and the requirements of the additional numbers will severely tax agricultural resources.

TABLE 4.—*Far East: Relationship between population, agricultural production and agricultural land, by country, 1960*

Country	Population	Agricultural production	Agricultural land
	Percent	Percent	Percent
Afghanistan.....	1.6	1.2	1.1
Burma.....	2.6	4.2	4.2
Cambodia.....	.6	.7	.7
Ceylon.....	1.1	1.5	.7
India.....	49.3	42.1	62.4
Indonesia.....	10.5	9.8	8.1
Japan.....	11.0	13.0	2.3
Korea, South.....	2.7	2.3	.9
Laos.....	.3	.2	.3
Malaya, Fed. of.....	.8	2.2	1.0
Pakistan.....	10.4	11.6	10.4
Philippines.....	3.1	3.9	2.6
Singapore.....	.2	.1	.1
Taiwan.....	1.3	2.4	.4
Thailand.....	2.9	3.0	3.5
Vietnam, South.....	1.6	1.8	1.3
Total Far East.....	100.0	100.0	100.0

## Physical Setting

### Location and Area

The Free World countries in the Far East, considered aggregately, are almost identical in size with the United States. The three Asian Communist countries, with an area of 3.9 million square miles, are slightly larger than the United States. In terms of total land area, Mainland China completely dominates. China alone is larger than the United States, but the second largest country, India, is only one-third the size of the United States.

Most of the countries of the Far East, especially the larger ones, are on the Asian Mainland, but five are insularly situated.

Two—Taiwan and Ceylon—are single islands but the remaining three—Japan, Indonesia, and the Philippines—are island archipelagos. Advantages associated with the insular position, such as greater accessibility to low cost ocean transportation and exposure to the stimulus of outside influences, have played a key role in their development. Malaya, because of its peninsular location and comparable accessibility to ocean transportation, can also be included in this group. Considered aggregately, these countries have attained a level of development far above that of the mainland

countries. This differential level of development is even more striking when these countries are compared with the landlocked and inaccessible countries of Afghanistan, Laos, and Nepal.

### Topography

A few physical features dominate the land surface of the Far East. The vast Himalayan mountain range and plateau, aptly referred to as the rooftop of the world, encompasses the highest mountains found anywhere. The other mountain ranges in the area are dwarfed by comparison. The Himalayan range shelters the Indian subcontinent from the wintertime, cold air masses originating over the Soviet Union. With this shelter, the year-around climate is greatly stabilized on the subcontinent and the growing season is lengthened considerably.

The numerous rivers of the area, frequently called the "life lines," are the second outstanding physical feature. The rivers cannot be entirely disassociated from the Himalayas, for most of them originate in these mountains. Virtually every country on the mainland, with the exception of Malaya and Korea, depends on water from rivers which are born in the upper reaches of the Himalayas. Nearly all the great rivers of the Far East are snow-fed in the Himalayas. Their importance as a source of transport and as a source of water for rice cultivation can be best appreciated if population distribution is compared with the location of the rivers. Far Eastern agriculture is closely identified with the Ganges, Indus, and Brahmaputra Rivers of India and Pakistan; the Yellow and Yangtze Rivers of China; and the Irrawaddy and Mekong Rivers of Southeast Asia. These rivers are not only a source of water but in addition their vast flood plains

and fertile deltas comprise the principal rice-growing areas.

A third topographical feature of significance is the rugged, and in many places mountainous, nature of the island countries. This feature is most noticeable in Japan and Indonesia where the rugged topography limits the percentage of agricultural land to only 12 and 14 percent, respectively.

### Climate

Climate in the region ranges from the tropics of equatorially situated Indonesia to the temperate zone of most of China, Korea, and Japan. The monsoon, common to much of the area, is the outstanding climatic feature.

Monsoon climates are characterized by a concentrated rainy season followed by a long dry season. With the advent of summer, the air masses over the land are heated and rise. As they rise, they are replaced by the cooler maritime air masses moving in from the Indian and Pacific Oceans. When these air masses move inland they are forced upward and cooled, thus reducing their moisture carrying capacity. The continual movement of moisture laden air masses inland results in a heavy rainy season usually lasting most of the summer and commonly referred to as the Asian monsoon. As fall approaches, the land air masses are cooled, the direction of air flow is reversed and as the air masses move seaward, the long dry season begins.

The monsoonal climate prevails in much of the continental Far East and is particularly pronounced in the areas adjacent to the oceans. Some areas, especially in the interior, are isolated from the moisture-bearing maritime air masses and hence have very limited rainfall. Two such areas are the vast, virtually uninhabited Gobi Desert of the interior of

China and the Thar Desert of India and Pakistan. In the island countries rainfall is more evenly distributed throughout the year thus making multiple cropping more feasible.

Temperature variation between the seasons generally increases with the distance from the equator and with distance inland. In some spots, such as Colombo and Singapore, the average temperature for the coldest and warmest months differs by only 1° F. In interior areas of China, a similar comparison shows a temperature variation of 60° F.

The constant year-round temperatures and well distributed rainfall of the tropical island

countries make possible a type of agriculture quite different from that on much of the mainland. Certain tropical crops with highly specific growing requirements such as rubber and coconuts thrive in this environment.

In areas with a pronounced monsoon climate, the transplanting of rice, the food staple of the area, is timed to coincide with the advent of the rainy season. Natural rainfall lasting much of the growing season provides the water needed for successful rice cultivation. In some localized areas, usually on the periphery of the Asian land mass or the island countries, a brief fall monsoon rain occurs which is sufficient to grow a second crop.

## Agricultural Land

### Distribution

**By Country.**—Mainland China, by far the largest country in terms of both total land area and population, has less cultivated land than India. Measured on a per capita basis it has only 0.41 acres per person while India has 0.84 acres. The Free World countries have more cultivated land—both total and per capita—than the Communist countries. This advantage is largely offset, however, by the much higher index of multiple cropping and more extensive irrigation in Mainland China.

By way of contrast, Burma with 23 million cultivable acres, has nearly double the cultivated area of Japan but only one-fourth of the people to support. Three countries—Japan, with one-seventh of an acre per person and South Korea and Taiwan, with just over one-fifth acre per capita—have very low per capita land availabilities but on the other hand have attained the highest per capita production for the region.

**By farm.**—Traditional patterns of land distribution have been

altered to some extent by virtually every Far Eastern country since World War II. Behind the "bamboo curtain" the numerous small holdings have been consolidated into collectives or communes. This consolidation first took the form of mutual aid teams followed by cooperatives or collectives and then communes. All vestiges of private ownership disappear as the final stage—the formation of publicly owned and state controlled communes—is reached.

Virtually all Free World countries have also made some effort at altering the pattern of land ownership. Unlike the programs behind the "bamboo curtain," those of the Free World have sought to increase the number of holdings and the number of owners. Land reform programs initiated in Japan and Taiwan have been more thorough and more far reaching than in most countries.

In many countries, a certain homogeneity exists in the size of farms, but in those countries where peasant and plantation or

TABLE 5.—*Far East: Selected statistics on agricultural land, by country, 1959*

Country	Total land area	Agricultural share of total	Agricultural land <sup>1</sup>	Per capita agricultural land
Free world countries:				
Afghanistan.....	251	4	6.0	0.45
Burma.....	262	13	22.8	1.11
Cambodia.....	67	9	3.9	.81
Ceylon.....	25	22	3.6	.37
India.....	1,299	40	336.9	.84
Indonesia.....	576	12	43.7	.49
Japan.....	143	14	12.7	.14
Korea, South.....	37	21	4.9	.21
Laos.....	91	3	1.7	.81
Malaya, Fed. of.....	51	17	5.5	.82
Nepal.....	54	25	8.6	.94
Pakistan.....	365	24	56.1	.65
Philippines.....	116	19	14.1	.57
Taiwan.....	14	26	2.3	.23
Thailand.....	198	15	19.0	.87
Vietnam, South.....	66	16	6.8	.51
Total or average.....	3,615	24	548.6	.66
Asian Communist countries:				
China, Mainland.....	3,800	11	276.6	.41
Korea, North.....	47	17	5.1	.64
Vietnam, North.....	63	12	4.8	.32
Total or average.....	3,910	11	286.5	.41
Grand total or average...	7,525	17	835.1	.55

<sup>1</sup> Agricultural land refers to permanently cultivated area rather than potentially cultivable land and does not include grazing or waste land.

corporate agriculture exist side by side, a marked contrast is seen. Outstanding examples of countries in which plantation and peasant agriculture coexist are Ceylon, Malaya, Indonesia, and the Philippines.

Four countries—India, Indonesia, Japan, and the Philippines—have more farms than the United States. Japan, though smaller than California, has 6 million farms while the United States has only 3.7 million.

#### Multiple Cropping Index

The multiple cropping index is a numerical expression for the number of crops grown on a given amount of land during 1 year. In

countries plagued by a shortage of land, an increase in the number of crops produced offers at least a temporary solution.

The potential of multiple cropping is greatest in those countries having heavy rainfall and year-round warm temperatures but, interestingly enough, those countries actually having the highest index are countries with the most dense populations and not necessarily those with the most conducive environment.

In most tropical locations, temperatures vary little and warm weather crops may be produced the year-round. In cooler, temperate countries such as Japan or northern China, winter grains are

TABLE 6.—*Far East: Number and average size of farms, by country, 1959*

Country	Number of farms	Average size of farms <sup>1</sup>
	<i>Million</i>	<i>Acres</i>
Afghanistan.....	n.a.	n.a.
Burma.....	3.0	7.6
Cambodia.....	<sup>2</sup> .7	<sup>2</sup> 5.6
Ceylon.....	<sup>3</sup>	<sup>3</sup>
India.....	62.0	5.4
Indonesia.....	<sup>2</sup> 13.4	<sup>2</sup> 3.3
Japan.....	6.0	2.1
Korea, South.....	2.2	2.2
Laos.....	<sup>2</sup> .2	<sup>2</sup> 8.5
Malaya, Fed. of.....	<sup>3</sup>	<sup>3</sup>
Nepal.....	<sup>2</sup> 1.4	<sup>2</sup> 6.1
Pakistan.....	<sup>2</sup> 13.4	<sup>2</sup> 4.2
Philippines.....	1.6	8.8
Taiwan.....	.75	3.1
Thailand.....	2.0	9.5
Vietnam, South.....	1.6	4.2
(United States).....	3.7	95.0

<sup>1</sup> In terms of permanently cultivable land—does not include wasteland, grazing land, etc.

<sup>2</sup> Unofficial estimates based on fragmentary data.

<sup>3</sup> Wide differences between the numerous large commercially operated estates and peasant holdings are such as to make averages less meaningful in these countries.

often alternated with warm weather crops in the summer.

Moisture is often a limiting factor as an increase in the number of crops per year requires much more water. The construction of irrigation and storage facilities has enhanced the multiple cropping potential in many areas by retaining the excess water of peak rainfall periods for use during the ensuing dry season.

A rise in the incidence of multiple cropping must be accompanied by heavier fertilization and improved soil management practices, otherwise soil compaction and depletion result. The potential in the Far East is great and many countries now having little or no multiple cropping can undoubtedly approach or possibly even exceed the index of 2.0 in Taiwan.

### Irrigation

In no region of the world is irrigation so important to so many people as in the Far East. For 1.5 billion inhabitants to be supported on the limited land without it is inconceivable.

In this discussion, irrigation will be defined as artificial watering of farm land as distinguished from the rainfed rice fields so common to the heavy rainfall monsoon areas. Irrigation utilizes water stored or diverted from sources outside the field whereas the naturally rainfed paddy fields depend upon rainfall which is trapped and held within the field by dikes or bunds. Underground water is sometimes used but only in localized areas and on a limited scale.

In the "rice bowl" countries of Burma, Thailand, Cambodia, and South Vietnam, the greater part of the rice crop is produced in

TABLE 7.—*Far East: Agricultural land, multiple cropping index, planted area and irrigated area by country, 1959*

Country	Agricul-tural land <sup>1</sup>	Multiple cropping index	Planted area <sup>2</sup>	Irrigated area	
	Million acres	Area planted to 2 crops		Million acres	Million acres
Free World countries:					
Afghanistan . . . . .	6.0	neg.	6.0	( <sup>3</sup> )	( <sup>3</sup> )
Burma . . . . .	422.8	neg.	17.0	13	3.0
Cambodia . . . . .	3.9	neg.	3.9	18	.7
Ceylon . . . . .	3.6	1.11	4.0	20	.7
India . . . . .	336.9	1.14	384.1	26	87.6
Indonesia . . . . .	43.7	<sup>6</sup>	43.7	29	12.6
Japan . . . . .	12.7	1.59	20.2	55	7.0
Korea, South . . . . .	4.9	1.55	7.6	47	2.3
Laos . . . . .	1.7	neg.	1.7	( <sup>5</sup> )	( <sup>5</sup> )
Malaya, Fed. of . . . . .	5.5	neg.	5.5	9	.5
Nepal . . . . .	8.6	neg.	8.6	n.a.	n.a.
Pakistan . . . . .	56.1	1.14	63.9	43	23.6
Philippines . . . . .	14.1	1.27	17.9	14	1.6
Taiwan . . . . .	2.3	2.00	4.6	63	1.5
Thailand . . . . .	19.0	neg.	19.0	<sup>2</sup> 23	4.4
Vietnam, South . . . . .	6.8	1.08	7.3	( <sup>5</sup> )	( <sup>5</sup> )
Total or average . . . . .	548.6	1.12	615.0	27	145.5
Asian Communist countries:					
China, Mainland . . . . .	276.6	1.40	387.2	70	165.9
Korea, North . . . . .	5.1	1.10	5.6	<sup>2</sup> 20	<sup>8</sup> 1.0
Vietnam, North . . . . .	4.8	1.44	6.9	51	2.4
Total or average . . . . .	286.5	1.40	399.7	59	169.3
Grand total or average . . . . .	835.1	1.22	1,014.7	38	314.8

<sup>1</sup> Agricultural land refers to permanently cultivated land rather than potentially cultivable land.

<sup>2</sup> The planted area is calculated by applying the multiple cropping index to the agricultural land (permanently cultivated area) and does not allow for fallowed land or land not planted because of adverse weather conditions.

<sup>3</sup> Data are not available but a sizable share of the cropland requires irrigation.

<sup>4</sup> About one-fourth of agricultural land is usually fallow during any given year.

<sup>5</sup> Only a small percentage is under controlled irrigation but most of the crop land is rainfed and underwater during the growing season.

<sup>6</sup> In some places, such as Java, the multiple cropping index is quite high but in other areas much land is fallowed. The net result makes planted area and agricultural land about the same for any given year.

<sup>7</sup> Qualified western observers believe effective irrigation is well below that indicated by official figures.

<sup>8</sup> Estimate based on available data pertaining to the irrigation of rice.

rainfed fields rather than irrigated fields. In some cases, irrigation is used to supplement natural rainfall during extended dry periods. The Japanese, by way of contrast, irrigate some 96 percent of their rice acreage and have very little rainfed paddy land. The

furrow system common to southwestern United States or the sprinkler irrigation practiced in the more humid areas are rarely seen in the Far East.

Reservoirs or ponds are frequently situated in nearby hills or elevated areas in order that

farmers can utilize gravity flow to water their fields. Cooperative arrangements among farmers are required in the distribution and sharing of water.

When gravity feed is not possible farmers must employ some other source of power. More recently, and in the more advanced countries, electrical and internal combustion engines have been widely used. In many areas, however, farmers do not have access to electricity and can not afford internal combustion engines. These farmers must rely on the traditional sources of human or animal power. The centuries-old water wheel, common to both

China and Japan, is turned by treading on paddles. This requires an enormous expenditure of human effort to lift the amount of water required to flood a rice field. The Persian waterwheel, an ancient, animal-powered water lift, often used on the Indian subcontinent, is quite different from the water wheel of China and Japan. Another device employed in India and Pakistan consists of a hoist and a large leather bag which is filled with water and raised by animal power.

Although the proportion of agricultural land under irrigation in the Asian Communist countries is believed to be considerably over-

TABLE 8.—*Far East: Annual consumption of chemical fertilizer in terms of plant nutrients, by country, 1958-59*

Country	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Free World countries:		1,000 m. t.	1,000 m. t.
Burma.....	1.3	0.9	.....
Cambodia <sup>1</sup> .....	.2	2.1	0.2
Ceylon.....	36.8	2.1	23.2
India.....	165.5	27.2	16.5
Indonesia.....	27.7	12.9	4.9
Japan.....	683.8	299.7	435.6
Korea, South.....	150.8	134.8	4.3
Malaya, Fed. of <sup>1</sup> .....	17.1	3.4	7.1
Pakistan.....	16.5	1.1	.1
Philippines.....	20.2	7.1	9.2
Taiwan.....	97.5	37.3	28.6
Thailand <sup>1</sup> .....	1.5	1.9	3.2
Vietnam, South.....	15.6	1.2	1.9
Total.....	1,234.5	531.7	534.8
Asian Communist countries:			
Mainland China <sup>2</sup> .....	180.0	61.9	neg.
Korea, North.....	n.a.	n.a.	n.a.
Vietnam, North.....	n.a.	n.a.	n.a.
Total.....	180.0	61.9	.....
Total Far East.....	1,414.5	593.6	534.8
(United States).....	2,346.0	2,230.0	1,892.0

<sup>1</sup> Last year for which figures are available.

<sup>2</sup> Domestic production only. Incomplete data indicate an import volume about equal to production.

Source: Food and Agriculture Organization Production Yearbook 1960 (except Communist countries and India).

TABLE 9.—*Far East: Average per acre application of plant nutrients, by country, 1958-59*

Country	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
Free World countries:		<i>Pounds</i>	<i>Pounds</i>
Burma.....	0.13	0.09	.....
Cambodia <sup>1</sup> .....	.11	1.19	0.11
Ceylon.....	22.54	1.29	14.21
India.....	1.10	.18	.11
Indonesia.....	1.40	.65	.25
Japan.....	118.70	52.03	75.62
Korea, South.....	67.85	60.65	1.93
Malaya, Fed. of <sup>1</sup> .....	6.85	1.36	2.85
Pakistan.....	.65	.04	.004
Philippines.....	3.16	1.11	1.44
Taiwan.....	93.46	35.75	27.41
Thailand.....	.17	.22	.37
Vietnam, South.....	5.06	.39	.62
Average.....	5.49	2.25	2.20
Asian Communist countries:			
China, Mainland.....	1.30	.45	neg.
Korea, North.....	.....	.....	.....
Vietnam, North.....	.....	.....	.....
(United States).....	12.96	12.32	10.45

<sup>1</sup> In the absence of figures for 1958-59, figures for the last year available have been substituted.

reported, there can be little doubt that these countries do have substantially more land under irrigation than the Free World countries. Of all the Far East countries, Japan, Taiwan, and South Korea have the best developed irrigation systems. The irrigated land of the entire area, amounting to 38 percent of all agricultural land, is largely devoted to rice production.

### Fertilization

The practice of using chemical fertilizer is in its infancy in the Far East; millions of farmers have never so much as seen a bag of chemical fertilizer. Before World War II, chemical fertilization was largely confined to commercially operated plantations but now its use has spread to peasant agriculture, though only on a rather limited scale.

Only a fraction of the fertilizer that could be used is used at present. The extent of this unrealized potential may be easily demonstrated by comparing consumption in Japan with the remainder of the Far East. Japan has approximately 13 million of the 835 million acres of cultivated land in the Far East, yet it uses about one-half of all fertilizer utilized by both the Free World and Communist countries. Were fertilizer application rates throughout the region to reach levels currently existing in Japan, total usage would increase some sixtyfold.

In the practice of supplying crops with chemical fertilizers the Free World countries, even without Japan, have a commanding lead over the Communist countries. Taiwan, with its very high per acre returns, and with only 2.3 million acres of cultivated land,

uses one-third to one-fourth as much fertilizer as the whole of Mainland China.

A multiplicity of factors has hindered the expansion of fertilizer consumption in the area. Chief among these are a lack of distribution facilities; inadequate knowledge on the part of the farmers of the value of fertilizers; an inadequate knowledge of methods of application; price instability of crops; insecurity of tenure; and a lack of fertilizer production facilities.

The extended use of fertilizers is strategically important for it is the primary means of achieving higher yields and greater overall production of food and fiber. Chemical fertilization, however, only supplements the centuries-old practice of organic fertilization. Historically, organic fertilization has involved the gathering and composting of various materials such as straw, leaves, human and animal waste and other materials but more recently it has also come to include the production of green manure crops. This practice has been most fully exploited in Japan, China, and Korea.

### Reclamation Potential

The amount of land that can be added to the currently cultivated areas of the many Far East countries varies a great deal. A few countries can double the currently cultivated area but some will not

even be able to maintain the current area.

As the number of people within a country grows, the country goes through three successive stages in the population land relationship. In the first stage, land is plentiful and new land may be readily brought under cultivation by individual farmers. Burma, Thailand, and the Philippines are still in the first stage. In the second stage only large scale cooperative and government projects can bring additional land into production. These efforts may take the form of large scale irrigation or drainage projects; they may involve the clearing of land with heavy machinery; or they may consist simply of eradicating malaria from previously uninhabited areas. India now appears to be well into the second stage for most of the land being added to the cultivated area is the result of government sponsored reclamation projects.

When the third stage is reached it is no longer economically possible to expand the cultivated area and the acreage under cultivation begins to decline. The construction of highways, airfields, factories, and homes begins to encroach upon the farm land. This stage was reached in Japan several years ago and is now being approached in Taiwan. Once the third stage is reached, a country quite obviously has no alternative to increase production except through boosting yields.

## The Agricultural Production Pattern

### The Production Pattern in Retrospect

The outstanding feature of the agricultural production pattern over the past quarter century has been its remarkable constancy. There have been no marked changes in the relative contribu-

tion of any commodities or groups of commodities to overall production. Many changes are, in fact, barely perceptible and may reflect only the vagaries of weather or the variations in the accuracy of the statistics employed.

Perhaps the most strategic relationship in the production pat-

TABLE 10.—*Free World countries of the Far East: Production of specified agricultural commodities as percent of total value of agricultural production, averages for 1935-39, 1952-54 and annual figures for 1957-60*

Commodity	1935-39	1952-54	1957	1958	1959	1960
Grains:						
Rice, paddy.....	41.5	40.2	38.0	40.4	39.9	39.8
Wheat.....	6.7	6.8	7.3	6.5	7.2	7.3
Barley.....	2.0	2.4	2.2	2.0	2.1	2.1
Corn.....	2.6	2.8	2.6	3.0	2.8	2.9
Millet and sorghum.....	5.1	6.0	5.4	5.6	5.3	5.3
Other grains.....	0.1	0.1	0.1	0.1	0.1	0.1
	58.1	58.3	55.6	57.6	57.4	57.5
Roots and tubers:						
White potatoes.....	1.0	1.3	1.4	1.4	1.4	1.4
Sweet potatoes.....	1.1	1.7	1.7	1.7	1.8	1.7
Cassava.....	2.0	1.8	1.9	1.9	2.0	1.9
Other root crops.....	0.1	0.1	0.1	0.1	0.1	0.1
	4.2	4.9	5.1	5.1	5.3	5.1
Pulses.....	5.4	5.8	6.4	5.4	6.7	5.9
Sugar.....	3.8	3.5	3.8	4.0	4.1	4.0
Oil bearing crops:						
Castor beans.....	0.1	0.1	0.1	0.1	0.1	0.1
Copra.....	2.4	2.2	2.3	2.1	2.0	2.0
Flaxseed.....	0.3	0.2	0.2	0.1	0.2	0.2
Palm oil.....	0.1	0.1	0.1	0.1	0.1	0.1
Peanuts, shelled.....	2.9	3.0	3.5	3.6	3.2	3.2
Rape and mustard seed.....	0.9	1.0	1.1	0.9	0.9	1.0
Sesame.....	0.7	0.8	0.5	0.7	0.6	0.6
Soybeans.....	0.7	0.7	0.7	0.6	0.6	0.6
Cottonseed.....	2.5	2.0	2.1	1.9	1.6	1.8
	10.6	10.1	10.6	10.1	9.3	9.6
Fruits and vegetables:						
Fruits.....	2.5	2.4	2.8	2.9	2.9	3.1
Vegetables.....	0.5	0.5	0.5	0.5	0.5	0.5
	3.0	2.9	3.3	3.4	3.4	3.6
Fibers:						
Cotton.....	3.1	2.6	2.7	2.4	2.0	2.3
Jute.....	1.7	1.5	1.7	1.8	1.6	1.6
Other fibers.....	0.4	0.2	0.2	0.2	0.2	0.2
	5.2	4.3	4.6	4.4	3.8	4.1
Rubber.....	3.1	4.6	4.4	4.3	4.4	4.4
Beverage crops:						
Tea.....	2.1	2.4	2.4	2.4	2.3	2.4
Coffee.....	0.4	0.2	0.3	0.3	0.3	0.4
	2.5	2.6	2.7	2.7	2.6	2.8
Spices.....	1.0	0.8	1.0	0.9	0.8	0.8
Tobacco.....	3.1	2.2	2.5	2.1	2.1	2.2
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

tern is that existing between food and nonfood crops. Over the past quarter century, the production of food crops appears to be gaining slightly at the expense of nonfood crops. This trend, most evident when the prewar period is contrasted with the last few years, is at least in part a reflection of the growing pressure of population on the limited agricultural resources.

Among the food crops, grain and sugar show no discernible trend in their proportion of the total production but pulses, fruits, roots, and tubers show some gain. Gains made by these commodities have been made possible by the relative decline in importance of oil-bearing crops and nonfood crops.

In the nonfood category, the position of both fibers and tobacco has declined and more than offset the gains made by rubber during the Second World War. World rubber consumption has risen steadily since World War II, but much of the additional demand has been satisfied by synthetic rubber. The position of rubber in the production pattern has, therefore, remained rather constant in recent years.

Population has pressed upon the land for many decades and in some places for centuries. Subsistence agriculture with its narrow margins has left little room for flexibility. Agricultural production has not gained enough on population to permit any appreciable shifts. Any efforts to project the supply of various agricultural commodities in the future should consider the historical rigidity of the production pattern.

### **The Present Production Pattern**

Rice accounts for 40 percent, by value, of all agricultural production in the Far East. In only three countries does rice yield its pre-eminence to another crop. Wheat

supplants rice as both the principal crop and food staple in Afghanistan. Malaya stresses production of rubber, its leading foreign exchange earner, to the exclusion of most other crops and must, therefore, depend upon imports for much of its rice supply. In Ceylon, rice is supplanted by tea, the major foreign exchange earner.

Grains, sugar, roots, and tubers—all for the most part high-calorie, starchy foods—account for 67 percent or exactly two-thirds of all agricultural production. Pulses, fruits, and vegetables account for nearly 10 percent of total production as do oil bearing crops when considered aggregate-ly. The remaining 14 percent or so is comprised of nonfood crops such as cotton, jute, rubber, tea, spices, and tobacco.

The relationship between food and nonfood crops in most countries does not differ much from that for the region as a whole. There are, however, two notable exceptions—Malaya and Ceylon. In Malaya, the production of food-stuffs amounts to only 29 percent of all agricultural production and in Ceylon the corresponding figure is 39 percent. Three of the most densely populated countries in the area—Japan, South Korea and Taiwan—allocate 94 percent or more of their agricultural resources to the production of food.

Several agricultural economies of the area are monocultures—they rely heavily on the production of a single crop. In Burma, Thailand, Cambodia, Laos, and South Vietnam (the “rice bowl” countries) rice completely overshadows all other crops combined. Malaya is almost equally dependent on rubber.

### **Determinants of the Production Pattern**

Physical factors, largely climate and soil, are the most obvious

TABLE 11.—*Far East: Agricultural production pattern by major commodities for Free World countries, 1960<sup>1</sup>*  
 [In 1,000 metric tons]

Country	Rice <sup>2</sup>	Wheat	Other grains	Roots and tubers	Pulses	Sugar	Copra	Peanuts	Other oil bearing crops <sup>3</sup>	Rubber	Cotton	Tea	Tobacco	
Afghanistan...	476	2,041	907	30	234	7	190	108	20	20	15	17	4	39
Burma...	8,300	15	131	29	183	30	450	2	26	40	6	190	4	6
Cambodia...	1,460	...	170	260	11,423	6,557	660	3,150	4,124	27	871	329	285	285
Ceylon...	740	...	8	8,270	14,390	1,078	254	69	595	700	66	66	66	76
India...	45,000	9,890	22,658	2,200	9,875	343	212	153	663	153	9	9	81	126
Indonesia...	12,462	1,526	2,692	1,184	725	22	...	...	...	...	...	...	...	30
Japan...	16,169	1,163	11	108	108	137	...	...	...	...	...	...	...	...
Korea, South...	3,094	...	...	...	...	...	...	...	...	...	...	...	...	...
Laos...	450	...	...	...	...	...	...	...	...	...	...	...	...	...
Malaya, Fed of...	800	...	...	...	...	...	...	...	...	...	...	...	...	...
Pakistan...	13,731	4,065	1,349	1,144	1,096	1,032	1,032	99	747	4	4	4	4	3
Philippines...	3,787	...	1,014	1,259	40	1,474	1,189	13	3	318	25	25	25	97
Taiwan...	2,359	63	25	2,786	24	908	229	75	54	...	...	...	...	63
Thailand...	7,300	...	400	...	101	206	73	110	183	12	12	12	12	14
Vietnam, South...	5,600	...	27	10	39	21	...	78	78	...	...	...	...	26
Total...	121,728	17,763	32,776	37,703	13,370	11,724	3,764	3,826	6,970	1,893	1,242	721	721	774

<sup>1</sup> Many figures are preliminary.

<sup>2</sup> Rough rice.

<sup>3</sup> Includes such crops as rapeseed, soybeans, sesame, palm oil and flaxseed.

determinants of the production pattern. The dominance of rice reflects the warm, moist monsoon climate so ecologically ideal for its cultivation. Both wheat and corn are plagued by diseases in this warm, humid environment. In China and India, a rather clearly delineated east-west line, determined largely by rainfall separates the southern rice growing areas from the northern wheat areas.

Those tropical crops such as rubber and coconuts, which require constant all-year warm temperatures and rainfall distributed throughout the year, find an ideal habitat in the island countries of Ceylon, Indonesia and the Philippines and the peninsular country of Malaya. Tea, another crop with rather specific growing requirements, seems to be peculiarly well adapted to the well-drained, sloping hillsides of Ceylon and eastern India.

Aside from physical factors, the relationship between population and land—the man-land ratio—is probably the most influential de-

terminant of the production pattern. This influence is felt in two ways. Heavy population pressure requires the cultivation of crops returning high calorie yields per acre. A high man-land ratio also provides an abundance of cheap labor which is conducive to the production of labor-intensive crops such as tea, silk and rice.

Physical factors and the man-land ratio are undoubtedly the principal determinants of the production pattern but other factors such as accessibility to markets and consumer preferences (often inherent within a culture) must also be considered.

### The Role of Livestock

Of the 19 countries in the Far East, only 1—Afghanistan—has a sizeable livestock industry. For the many nomadic peoples of Afghanistan, livestock husbandry is virtually a way of life. Livestock products such as wool and Karakul skins dominate the Afghan export scene.

In much of the world, livestock

TABLE 12.—*Far East: Food commodities and nonfood commodities as percent of total agricultural production, by country, 1960*<sup>1</sup>

Country	Food commodities	Nonfood commodities
	Percent	Percent
Afghanistan.....	97.9	2.1
Burma.....	95.3	4.7
Cambodia.....	84.5	15.5
Ceylon.....	38.9	61.1
India.....	89.2	10.8
Indonesia.....	76.0	24.0
Japan.....	95.8	4.2
Korea, South.....	95.5	4.5
Laos.....	100.0	.....
Malaya, Fed. of.....	29.0	71.0
Pakistan.....	85.4	14.6
Philippines.....	92.3	7.7
Taiwan.....	94.7	5.3
Thailand.....	83.3	16.7
Vietnam, South.....	90.9	9.1

<sup>1</sup> The term "food commodities" here is confined to those foods which are edible and which yield calories. Tea, for example, is not considered a food crop.

are principally important as a source of food, but in the Far East they are important first as a source of draft power. The conversion of grains into livestock products for human consumption is a costly process and one which the people of the area cannot generally afford. Cattle and buffalo are used to till the fields and to power various devices used to lift water for irrigation. They are widely used in threshing operations and when hitched to carts, provide a means of transporting people and freight particularly grain and straw. Cattle and buffalo serve as a means of converting roughage and other materials into energy which can be used to supplement manpower and thus

increase the per capita productivity of farmers. They are fed little or no grain and so do not compete with man for the limited grain supply; animals subsist for the most part on uncultivated grasses and rice straw.

Livestock are secondarily important as a source of organic fertilizer. For many centuries, farmers of China and Japan, in particular, have assiduously collected, composted, and returned to the fields all available animal manure. In some countries, mostly India and Pakistan, cow dung is an important fuel.

Milk production and consumption are very low throughout the area. Cattle or buffalo subsisting largely on low quality roughage,

TABLE 13.—*Far East: Number of cattle, hogs, and sheep by country 1958*

Country	Cattle and buffalo	Hogs	Sheep
Free World countries:		<i>Thousands</i>	<i>Thousands</i>
Afghanistan.....	2,500	neg.	14,000
Burma.....	6,180	569	37
Cambodia.....	1,357	452	neg.
Ceylon.....	2,140	43	65
India.....	1200,392	13,890	39,373
Indonesia.....	17,576	1,915	neg.
Japan.....	3,120	1,649	916
Korea, South.....	967	1,233	21,700
Laos.....	500	177	neg.
Malaya, Fed. of.....	546	398	neg.
Nepal.....	5,200	3n.a.	n.a.
Pakistan.....	30,130	n.a.	6,200
Philippines.....	4,492	6,084	neg.
Taiwan.....	423	3,331	neg.
Thailand.....	11,339	3,922	neg.
Vietnam, South.....	1,232	2,565	neg.
Asian Communist countries:			
Mainland China.....	64,100	120,000	53,435
North Korea.....	660	1,460	140
North Vietnam.....	n.a.	n.a.	n.a.
Total Far East <sup>4</sup> .....	349,380	149,000	131,200
World total <sup>4</sup> .....	972,280	428,555	943,720

<sup>1</sup> Average for 1951-55.

<sup>2</sup> Includes goats.

<sup>3</sup> Not available.

<sup>4</sup> Estimated total.

and often used as draft animals, do not produce much milk beyond that required by their offspring.

A large part of the animal protein consumed is produced by animals other than draft animals, namely pigs and poultry. Both economic and religious factors are responsible for this. On economic grounds, cattle must be conserved for draft purposes where religious customs discourage the slaughter of cattle. In India, the Hindu religion forbids the slaughter of cattle. Some Buddhist countries also adhere to this custom although somewhat less stringently. In Indonesia and Pakistan, both Muslim countries, the consumption of pork is frowned upon but pork is a major source of animal protein

in both Mainland China and Taiwan

The standard of living in most countries is such that the calorie level of consumption rather than the composition of the diet is of transcendent importance. Some few countries, however, such as Japan, Taiwan, and the Federation of Malaya have attained a reasonably adequate level of consumption and attention is being given to the composition of diet with special reference to animal protein. Japan in particular plans to allocate a much larger share of its agricultural resources to the development of a sizeable livestock industry in the years immediately ahead.

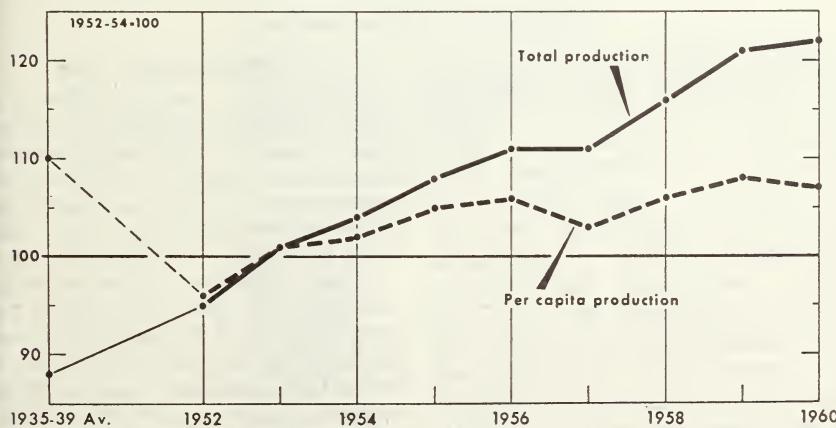
## Agricultural Production Trends

### Production Trends by Country

The Free World countries as a group have raised overall agricultural production about 3 percent annually or about 1 percent faster than population since the 1952-54 period (fig. 2). Most countries have made considerable progress

during the last few years but others have made little or none. South Vietnam's doubling of production since 1952-54 has been largely a function of recovery from the Indo-Chinese war. South Korea and Cambodia also show substantial gains but they too have been recovering from war

**FAR EAST: Indices of Agricultural Production,  
Total and Per Capita**



damage. A small group of countries—Japan, Malaya, Taiwan, Thailand and the Philippines—have made outstanding real gains since the 1952-54 period.

Another group of countries—Burma, Ceylon, India, Indonesia and Pakistan—have made some progress but have lagged behind the area as a whole. These countries have been hard-pressed to provide for their steadily growing populations. Two countries, both landlocked and isolated from the stimulus of outside progress—Afghanistan and Laos—have scarcely maintained the production levels of the 1952-54 base period. (Table 14.)

### Per Capita Production Trends by Country

The Far East has expanded per capita agricultural output about 1 percent annually on the average since 1952-54. All countries have made some gains except four—Afghanistan, Ceylon, Indonesia, and Laos. If the period from 1935-39 to 1960 is considered, then per capita output for the region has actually declined. Six countries, however—India, Japan, Laos, Malaya, Thailand, and the Philippines

—have shown per capita increases. Japan has been outstanding in the group. (Table 15.)

Agricultural output has expanded much more rapidly during the past few years than ever before. Much of the long term decline in per capita output occurred during the 1940's largely as the result of crop loss and disruption of normal economic activities associated with World War II. Gains in per capita output made in the 1950's did much to offset the earlier losses. Should the present trend continue, per capita output will likely regain the level of the prewar period within the next few years.

To make substantial gains on a per capita basis during the 1950's, agricultural production had to expand more rapidly than ever before because population was growing at an unprecedented rate. The ability of agriculture to gain more rapidly is largely attributable to a broader application of technology. This same factor—the application of technology—in the field of health and sanitation, has reduced infant mortality and the incidence of most major diseases thus setting the stage for an accelerated population growth rate.

## Agricultural Productivity

Productivity is here defined as the relationship between production and the investment of a specific factor of production (land, labor, etc.). In the Far East, capital inputs are quite small with home grown seed likely the most important capital component. Land, because of its scarcity, must be considered as one of the most limiting factors. Labor and the fourth factor of production, the entrepreneur, may be treated as one since the peasant, in addition to being the entrepreneur, is also the chief source of labor.

### Production Per Acre

The calories produced per acre could serve to measure production; however, this measurement would not include the nonfood commodities. A measurement encompassing both food and non-food products, is therefore used.

Few indicators show so much variation as does production per acre. Japan and Taiwan, with their high capital inputs, well developed irrigation systems, and multiple cropping, are in a class by themselves (fig. 3). South Korea and the exporting countries of Malaya and Ceylon, with production per

acre valued at over \$100, comprise a second group behind the leaders but well ahead of the remainder of the countries. Some indications of the most effective

means of raising production may be obtained by comparing the various combinations of inputs used in the countries with higher production levels. (Table 16.)

TABLE 14.—*Far East: Indices of agricultural production, by country, average 1935-39, 1952-54 and annual 1957-60*

Country	Total					
	1935-39	1952-54	1957	1958	1959	1960 <sup>a</sup>
Afghanistan.....	100	100	85	100	97	101
Burma.....	107	100	107	114	118	119
Cambodia.....	88	100	121	121	132	133
Ceylon.....	74	100	109	114	114	112
India.....	83	100	108	113	116	117
Indonesia.....	93	100	106	112	114	114
Japan.....	83	100	127	132	140	145
Korea, South.....	101	100	117	124	126	125
Laos.....	70	100	109	113	102	98
Malaya, Fed. of.....	74	100	113	116	125	130
Pakistan.....	103	100	107	105	116	113
Philippines.....	73	100	121	128	130	140
Taiwan.....	89	100	122	130	132	130
Thailand.....	58	100	96	112	120	124
Vietnam, South.....	162	100	144	165	198	208
Total.....	88	100	111	116	121	122

<sup>a</sup>Estimated for prewar.

<sup>b</sup>Federation of Malaya and Singapore combined prewar.

<sup>c</sup>Preliminary.

**FAR EAST: Value of Agricultural Production Per Acre  
of Cultivated Land, Average 1957-59**

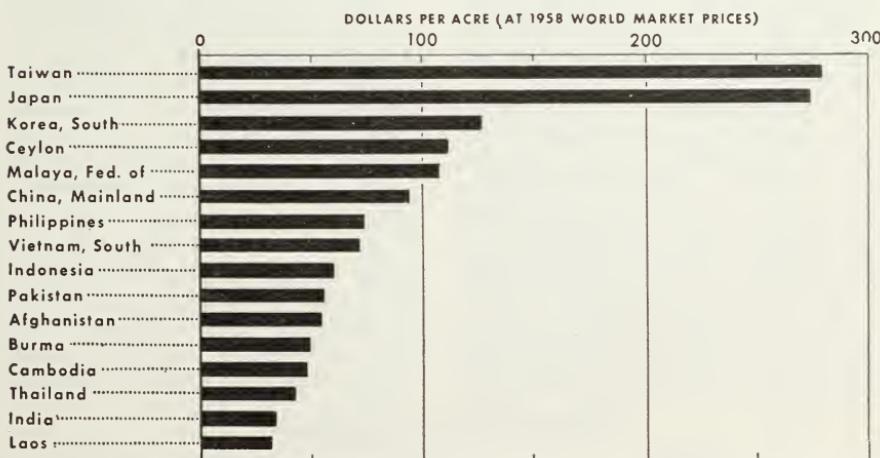


TABLE 15.—*Far East: Indices of per capita agricultural production, by country, average 1935-39, 1952-54 and annual 1957-60*

Country	Per capita					
	1935-39	1952-54	1957	1958	1959	1960 <sup>a</sup>
Afghanistan.....	1114	100	82	95	92	94
Burma.....	134	100	99	104	105	104
Cambodia.....	124	100	110	108	116	114
Ceylon.....	106	100	98	101	98	93
India.....	102	100	101	104	105	104
Indonesia.....	109	100	99	102	101	98
Japan.....	102	100	121	125	131	134
Korea, South.....	142	100	108	113	112	109
Laos.....	70	100	103	105	93	88
Malaya, Fed. of.....	299	100	98	98	102	104
Pakistan.....	126	100	101	98	106	102
Philippines.....	107	100	109	112	110	115
Taiwan.....	144	100	106	109	107	102
Thailand.....	84	100	86	97	102	102
Vietnam, South.....	235	100	121	135	160	164
Total.....	110	100	103	106	108	107

<sup>1</sup> Estimated for prewar.

<sup>2</sup> Federation of Malaya and Singapore combined prewar.

<sup>a</sup> Preliminary.

### Production Per Person

When per capita agricultural production is calculated by relating agricultural production to the entire population, one weakness is evident—the agricultural share of the population is not the same in all countries. In the Far East, however, it varies little, ranging usually between two-thirds and four-fifths of the population except in Japan where it is well below two-fifths.

At first glance, it might seem that production per person engaged in farming would be highest in those countries with the highest per capita availability of agricultural land, but such is not the case. Two of the three having the highest per capita production in the agricultural sector—Japan and Taiwan—have the lowest per capita land availability. These two

countries, however, have the highest per capita inputs in the form of fertilizer, pesticides, and improved seeds. They also rank high in land under irrigation and multiple cropping. It thus appears that capital, when available, can readily be substituted for land to expand production.

Those countries having an export-oriented pattern of production also seem to be among the highest in terms of output per agricultural worker. Prime example of this are Malaya and Ceylon. Countries having high per capita agricultural output are also able to maintain a high level of calorie consumption. The top three countries in terms of per capita output—Malaya, Taiwan, and Japan—have, by a good margin, the highest calorie intake level in the Far East. (Table 17.)

### Review of Commodities

#### Grains

**Rice.**—Wheat is the staple food in the Western world, but in the

Far East it is rice. Ninety-two percent of the world's rice supply is produced by the farmers of this

area. In terms of world acreage, wheat outranks rice, but in terms of production, rice is easily first because of its higher yields (fig. 4).

In direct contrast with other food grains, very little rice is utilized as animal feed and the small portion that is fed to livestock is often unsuitable for human consumption. Rice requires little processing other than removal of husks and bran. Both the fat and protein content of rice are low thus contributing to its non-perishable character in a hot damp climate.

Like wheat, rice is a cultivated grass but its cultural requirements are quite different. It requires both warm temperature and much moisture. Level land and impervious soils are required to keep it under water during the growing season. Where land is not level but the other requirements are met—as in parts of Japan, China, Indonesia, Nepal, and other countries—a hillside terrace cultivation has developed.

Rice production is concentrated along the great rivers of Asia: the Ganges and Brahmaputra of India; the Irrawaddy, Salween, and Mekong of Southeast Asia; and the Yangtze and Yellow Rivers of China. Nearly all of the rivers have broad alluvial flood plains and rich delta areas which are utilized mostly for rice production. In Japan and Taiwan much rice is produced on the flat, well watered coastal plains.

Mainland China, the leading producer, accounts for one-third of world production. India, the second ranking producer, has a greater acreage than China, but yields are only half as high (fig. 5). Closely grouped further down the list but also making a sizable contribution are Japan, Pakistan, and Indonesia. Only the "rice bowl" countries of Burma, Thailand, Cambodia, and South Viet-

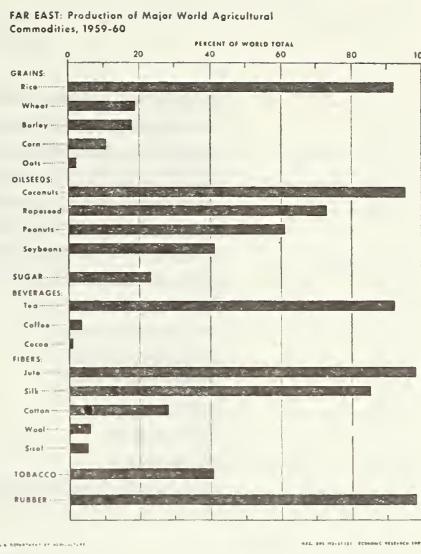


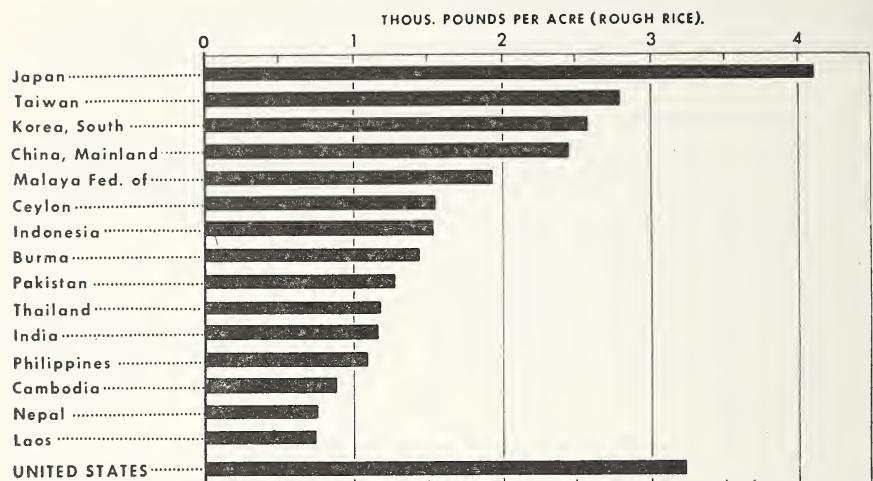
Figure 4

TABLE 16.—*Far East: Annual agricultural production per acre of agricultural land, valued at 1958 world market prices, average 1957-59*

Country	Value per acre
Dollars	
Free World countries:	
Afghanistan.....	54
Burma.....	49
Cambodia.....	48
Ceylon.....	111
India.....	33
Indonesia.....	60
Japan.....	274
Korea, South.....	126
Laos.....	31
Malaya, Fed. of.....	107
Pakistan.....	55
Philippines.....	74
Taiwan.....	279
Thailand.....	42
Vietnam, South.....	71
Asian Communist countries:	
China, Mainland.....	94
Korea, North.....	<sup>1</sup> n.a.
Vietnam, North.....	n.a.
(United States).....	76

<sup>1</sup> Not available.

FAR EAST: Rice Yields Per Acre, Average 1957-59



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NEG. ERS 194-61 (5) ECONOMIC RESEARCH SERVICE

Figure 5

TABLE 17.—*Far East: Annual agricultural production per capita, total population and rural sector, valued at 1958 world market prices, by country, average 1957-59*

Country	Total population	Rural sector
	Dollars	Dollars
Free World countries:		
Afghanistan.....	24	27
Burma.....	55	79
Cambodia.....	40	47
Ceylon.....	43	71
India.....	28	39
Indonesia.....	30	38
Japan.....	38	102
Korea, South.....	27	39
Laos.....	26	28
Malaya, Fed. of.....	90	135
Pakistan.....	36	54
Philippines.....	43	72
Taiwan.....	65	114
Thailand.....	37	45
Vietnam, South.....	36	49
Asian Communist countries		
Mainland China.....	40	47
North Korea.....	<sup>1</sup> n.a.	n.a.
North Vietnam.....	n.a.	n.a.
(United States).....	(152)	(1,384)

<sup>1</sup> Not available.

TABLE 18.—*Free World countries of the Far East: Summary of agricultural production by commodities, average 1935-39, 1952-54 and annual 1957-60*

Commodity	Production					
	1935-39	1952-54	1957	1958	1959	1960
Grains:	1,000 m.t.					
Rice, paddy.....	91,774	102,987	105,778	117,814	121,243	121,728
Wheat.....	11,792	13,896	16,192	15,075	17,488	17,763
Barley.....	4,494	6,191	6,125	5,693	6,464	6,402
Corn.....	5,816	7,138	7,283	8,667	8,591	8,951
Millet and sorghum.....	11,915	16,182	15,710	17,217	16,830	17,172
Other grains.....	292	231	261	278	261	251
Roots and tubers:						
White potatoes.....	3,156	4,813	5,566	5,833	6,021	6,198
Sweet potatoes.....	7,167	12,519	13,937	14,574	15,556	14,845
Cassava.....	12,337	13,401	14,791	16,159	17,003	16,665
Other root crops.....	355	301	513	469	557	519
Pulses.....	8,895	10,960	13,281	11,758	15,027	13,370
Sugar <sup>1</sup> .....	8,068	8,574	10,219	11,143	11,873	11,724
Oil bearing crops:						
Castor beans.....	123	118	156	119	150	147
Copra.....	3,201	3,462	3,943	3,681	3,646	3,767
Flaxseed.....	513	379	408	271	472	451
Palm oil.....	240	208	219	209	210	216
Peanuts, shelled.....	2,425	2,929	3,735	4,052	3,784	3,826
Rape and mustard seed.....	1,142	1,424	1,645	1,509	1,589	1,627
Sesame.....	493	646	457	637	531	629
Soybeans.....	823	958	1,025	1,042	1,083	1,057
Cottonseed.....	2,724	2,614	2,945	2,737	2,433	2,785
Fruits and vegetables:						
Fruits.....	4,464	4,931	6,251	6,716	6,989	7,624
Vegetables.....	2,607	2,947	3,369	3,315	3,408	3,434
Fibers:						
Cotton.....	1,214	1,161	1,306	1,215	1,090	1,242
Jute.....	1,509	1,569	1,872	2,048	1,910	1,942
Other fibers.....	297	176	228	190	220	250
Rubber.....	952	1,642	1,728	1,748	1,855	1,895
Beverage crops:						
Tea.....	466	602	678	707	708	721
Coffee.....	141	90	120	126	152	167
Spices.....	214	215	274	250	249	249
Tobacco.....	787	644	801	716	751	774

<sup>1</sup> Combined tonnage of centrifugal and noncentrifugal sugar.

nam produce considerably more than they consume. The bulk of the rice exported by these countries goes to destinations within the area—mostly India, Pakistan, Indonesia, Ceylon, and Malaya.

In Japan, South Korea, Taiwan, and the Philippines, production and consumption are currently about in balance.

**Wheat.**—Wheat is the staple food in some of the more norther-

ly portions of India, China, and Korea and all of West Pakistan. Far Eastern countries, including Communist countries, contribute about one-fifth of the world supply or an amount slightly larger than U.S. production. A rather sharply delineated line separates the wheat and rice growing areas.

Wheat and corn are sometimes grown in the same area, but most of the wheat is found in areas too dry or too cold for successful corn cultivation. Both spring and winter wheat are produced, but winter wheat is the most common.

**Corn.**—Corn is a minor crop in the Far East. The climatic

TABLE 19.—*Free World countries of the Far East: Indices of agricultural production, by commodity, average 1935-39, 1952-54 and annual 1957-60*

Commodity	1935-39	1952-54	1957	1958	1959	1960
<b>Grains:</b>						
Rice, paddy.....	89	100	103	114	118	118
Wheat.....	85	100	117	108	126	128
Barley.....	73	100	99	92	104	103
Corn.....	81	100	102	121	120	125
Millet and sorghum.....	74	100	97	106	104	106
Other grains.....	126	100	113	120	113	109
<b>Roots and tubers:</b>						
White potatoes.....	66	100	116	121	125	129
Sweet potatoes.....	57	100	111	116	124	119
Cassava.....	92	100	110	121	127	124
Other root crops.....	118	100	170	156	185	172
Pulses.....	81	100	121	107	137	122
Sugar.....	94	100	120	130	139	138
<b>Oil bearing crops:</b>						
Castor beans.....	104	100	132	101	127	125
Copra.....	92	100	114	106	105	109
Flaxseed.....	135	100	108	72	125	119
Palm oil.....	115	100	105	100	101	104
Peanuts, shelled.....	83	100	128	138	129	131
Rape and mustard seed.....	80	100	116	106	112	114
Sesame.....	76	100	71	99	82	97
Soybeans.....	86	100	107	109	113	110
Cottonseed.....	104	100	113	105	93	107
<b>Fruits and vegetables</b>						
Fruits.....	91	100	127	136	142	153
Vegetables.....	88	100	114	112	116	117
<b>Fibers:</b>						
Cotton.....	105	100	112	105	94	107
Jute.....	96	100	119	131	122	124
Other fibers.....	169	100	130	108	125	142
Rubber.....	58	100	105	106	113	115
<b>Beverage crops:</b>						
Tea.....	77	100	113	117	118	120
Coffee.....	157	100	133	140	169	186
Spices.....	100	100	127	116	116	116
Tobacco.....	112	100	124	111	117	120

transition between the humid monsoon areas and the semiarid areas in the interior is rather abrupt thus making most of the area either too wet or too dry for the production of corn. Corn production amounts to only a fraction of U.S. production.

In the United States, corn is used almost entirely as a feedgrain, but in the Far East the mode of utilization more closely resembles that of Latin America or sub-Saharan Africa, where it is a food staple. Yields per acre average about 14 bushels in most of the Far East as compared with over 51 bushels in the U.S. It is not likely that corn will increase much in importance as cultural requirements seriously limit the growing area and it is generally considered an inferior food. Corn production is expanding most rapidly in Thailand where it is produced for export as a feedgrain to Japan.

**Barley.**—Barley, like corn, is primarily a food grain in the Far East although in many western countries both are consumed largely by livestock. Mainland China, where barley is the staple food in localized areas, ranks second to the U.S., currently the leading producer. India and Japan are the other important barley producers in the area. Per acre yields are well below those in the United States except in Japan where they compare favorably.

### Oilseeds

**Peanuts.**—Combined peanut production in India and China, the first and second ranking world producers, amounts to one-half of the world's supply. In both these countries peanuts are the principal source of vegetable oil and nearly all are consumed domestically. About 80 percent of the peanuts grown in India are crushed for oil.

**Soybeans.**—Two countries produce over 90 percent of the world's soybeans: Mainland China and the United States. Other countries producing small but significant quantities of soybeans are Japan and Indonesia.

The soybean is native to China and flourished there for centuries before being introduced to the United States only a few decades ago. Soybeans produced in the Far East are consumed mostly as food thus providing a valuable source of protein. This contrasts strongly with the United States where soybeans are used largely for oil extraction and where the meal is fed to livestock.

**Coconuts.**—Coconuts are confined largely to the tropics and seem to do best in areas fringing the ocean. They are grown throughout the coastal margins of both the Indian and the Southwest Pacific Oceans. The coconut palm requires an abundance of sunshine, continual warmth and heavy rainfall, usually 50 inches or more per year.

The production of copra, a major oilbearing commodity in world commerce, is largely limited to the Far East. Unlike many tropical export crops, coconuts are produced by peasants rather than on plantations. The flesh of the coconut is prepared in a number of ways and in some of the producing countries it is considered a secondary staple. The Philippines and Indonesia are the main exporters.

The coconut consists of four distinct parts—the outer husk, the shell, the inner flesh part (the meat) which is edible, and in the center the "milk." The fleshy meat of the coconut, known as copra when dried, may contain as much as 60-65 percent of oil. Copra is the principal coconut product exported but small quantities of dried shredded (desiccated) coconut are also exported,

mostly to Western Europe and North America.

### Fibers

**Cotton.**—The Far East produces about one-third of the world crop of 46 million bales. China, second only to the United States in world ranking, produces about 7.5 million bales. The other two important producers are India, with about 4 million bales, and Pakistan, with about 1.4 million bales. The bulk of the cotton produced in India, China, and Pakistan is short staple cotton. Cotton exports, almost entirely short staple, are only a fraction of imports which are principally of a long or medium staple.

**Jute.**—The production of jute is confined almost entirely to the Far East and more specifically to the Indian subcontinent. It is one of the world's leading soft fibers and is used largely for burlap and bagging.

As a result of the 1947 partition of the Indian subcontinent, about two-thirds of the jute producing areas were on the Pakistan side of the border but the jute processing mills were concentrated in India. In order to reduce dependence on Pakistani sources for the raw jute, India has expanded jute production. Since partition, production has remained rather static in Pakistan but in India it has expanded steadily and today India's contribution to the world supply closely approaches that of Pakistan. India mills nearly all its jute before exporting whereas Pakistan ships out a large part of its crop unprocessed. Jute, in one form or another, accounts for about one-sixth of India's foreign exchange earnings.

**Silk.**—The Far East accounts for 85 percent of world silk production and Japan, the leading world producer, contributes about one-half of the world supply. In

second and third place are Mainland China and India.

In order to produce silk on large scale at least two conditions must be met. First, labor must be plentiful for the feeding and caring of silkworms, and for unwinding of the cocoons. Second, silkworms feed on mulberry leaves and a moist climate is needed to rejuvenate the mulberry plant after their leaves are picked.

### Sugar

Far Eastern countries account for 23 percent of world sugar production. By far the greater part of the sugar produced in the area comes from cane, but in the northern latitudes of some countries notably Mainland China and Japan, limited quantities of sugar beets are produced. Some tropical plants other than cane and beet are used for sugar manufacturing in localized areas, but they provide only a fraction of the total supply. India vies with Brazil for second place as a world sugar producer behind Cuba. In addition both the Philippines, producing only cane sugar, and Mainland China, producing both cane and beet sugar, rank high as world sugar producers.

### Tea

World tea production is confined almost entirely to the Far East. India and Ceylon, both ideally suited for the large-scale production of tea, are the leading suppliers of tea for the international market.

Tea leaves are the dried leaves of an evergreen shrub which grows naturally in parts of eastern India. Three very specific conditions are necessary for the development of tea plantations: an abundant supply of labor to pick the small leaves; a climatic environment which permits the plants to recover rapidly after the

removal of leaves; and perfect drainage, for the plant cannot survive in standing water for even a short time. All these conditions are present in Assam in eastern India, and in much of Ceylon.

### **Pepper**

The Far East, for centuries the world's only source of pepper, produced 179 million pounds of the world production of 191 million pounds in 1960. Indonesia with a production of 77 million pounds and India with 62 million pounds are the principal producers. Ceylon and Sarawak also produce significant quantities. The combined production of these countries amounts to 160 million pounds or about 1 pound of table pepper for every 18 people in the world.

Pepper is obtained by grinding the dried unripe fruit of a climbing shrub which grows naturally in the tropical rain forests in parts of the Far East. The fruit of the pepper plant, berry-like and small, requires considerable labor to harvest.

### **Tobacco**

Tobacco, a rather adaptable plant, is produced in every country in the Far East and output of the region amounts to 40 percent of the world supply. Countries of

the region both export and import tobacco but on an aggregate basis the region is a net exporter. Mainland China is easily the leading regional producer and on a world basis is second only to the United States.

### **Rubber**

Although rubber is native to the Amazon valley of Brazil, it grows much better in certain parts of Southeast Asia; namely, Indonesia, Malaya, Ceylon, Thailand, Vietnam, and Cambodia. Rubber does best where climate is uniformly warm and wet. It requires temperatures which are consistently nearly 80° F. during all the seasons and an annual rainfall of close to 100 inches evenly distributed throughout the year.

The world rubber supply consisted entirely of natural rubber until World War II when synthetic rubber was developed. Transportation costs of natural rubber, which is produced in the tropics but consumed almost entirely in the middle latitudes, have become strategically significant in the keen competition with synthetic rubber. Countries with ready access to low-cost ocean transport have had a decided advantage over areas otherwise well suited for rubber production.

### **Peasant and Plantation Agriculture Compared**

Peasant and plantation or estate agriculture exist side by side in many Far Eastern countries. The total acreage in plantation agriculture is small when compared with that cultivated by peasants but production in estate agriculture is market oriented, and nearly all of it is destined for foreign markets. In contrast, peasant agriculture is subsistence oriented—most of the production is consumed by the producer. Plantations, found mostly in India, Ceylon, Malaya, Indonesia, and the Philippines produce principally rubber and tea.

Peasant holdings are usually limited to only a few acres whereas plantations frequently range up to several thousand acres in size. The smallholder's family is the chief source of labor in peasant agriculture, but plantations depend upon hired labor. A reluc-

tance to depend upon native labor has encouraged mechanization on plantations; also machines often perform more effectively or sometimes more efficiently than animals or hand laborers. Fertilizer,

pesticides, and other forms of capital inputs are used rather freely on estates. Improved practices, first adopted on plantations, frequently spread to the remainder of the agricultural sector.

## Agricultural Trade <sup>2</sup>

### Trade in Retrospect

Before World War II, the Far East was a net exporter of food grains but today it is a net importer of food grains and other foodstuffs as well. Net imports of food grains, currently amounting to 10 million tons annually, closely approximate the combined production of Burma and Thailand, the principal food exporting countries of the region.

From preindependence days the United States has looked to Europe as a market for its agricultural products, but in recent decades, the United States has begun to look for markets outside Europe. Next to Europe the principal and most promising outlet has been the Far East. Today Europe, once the only market, absorbs about one-half U.S. agricultural exports, the Far East about one-fourth and the rest of the world the remaining one-fourth. The Far Eastern share is currently expanding and in all likelihood will continue to expand in the years immediately ahead.

### Importance of Agricultural Trade

If Japan, the only industrial country in the area, is excluded from the trade figures, total exports are valued at \$4.8 billion and agricultural exports at \$3 billion. The Far East then, outside Japan, is dependent upon agricultural exports for two-thirds of its foreign exchange earnings. By comparison, the United States

realizes only about one-fourth of its foreign exchange earnings from agricultural exports. Aggregate agricultural exports for all the countries of the area, amounting to some \$3 billion annually, are \$1 billion less than the \$4 billion average agricultural export level of the United States.

Agricultural imports, at \$2.8 billion in 1958, were only slightly below exports but if Japan's share is deducted they drop to \$1.5 billion or only about half the level of exports. Net imports of food grains, which along with cotton completely dominate the agricultural import scene, provide an average of 110 calories daily for each of the 800 million inhabitants of the Free World Far East countries.

Agricultural exports, at \$3 billion annually amount to about one-ninth of the total agricultural production (\$27.5 billion) of the Free World countries. Agricultural products comprise the bulk of exports in every Far Eastern country except Japan, South Korea, and in some years, India. On the import side, agricultural items average about 30 percent of all imports for Free World countries and in no country do they represent more than half of total imports.

On a per capita basis, agricultural export revenues amount to a sizable proportion of income in countries with export-oriented agricultural sectors such as Malaya, Ceylon, Burma, Thailand, Taiwan, and the Philippines. Per capita agricultural exports are particularly large in Malaya and Ceylon.

<sup>2</sup> The discussion on trade refers only to Free World countries unless the Communist countries are specifically mentioned.

TABLE 20.—*Far East: Value of total trade and agricultural trade, by country, 1958*

Country	Exports		Imports	
	Total	Agricultural	Total	Agricultural
	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>
Burma <sup>2</sup> .....	227.1	197.4	296.5	130.9
Cambodia <sup>2</sup> .....	51.4	47.9	53.4	7.8
Ceylon.....	359.2	342.4	360.1	128.9
India.....	1,198.1	536.2	1,814.8	493.7
Indonesia.....	755.4	413.8	513.5	124.6
Japan.....	2,876.6	171.6	3,033.1	1,240.4
Korea, South.....	16.4	2.4	378.2	123.9
Malaya, Fed. of.....	615.3	452.3	541.2	211.3
Pakistan <sup>2</sup> .....	336.7	214.1	440.2	156.7
Philippines.....	459.8	336.9	553.3	122.8
Taiwan.....	155.8	129.7	226.2	151.8
Thailand.....	297.3	124.2	395.4	139.1
Vietnam, South.....	55.0	51.3	232.0	126.2
Total.....	7,404.1	3,038.2	8,837.9	2,758.1

<sup>1</sup> Total of principal agricultural commodities only.

<sup>2</sup> Figures for 1957.

NOTE.—Afghanistan, Laos, and Nepal have been omitted from total agricultural trade because of lack of data. Hongkong and Singapore have usually been omitted because of their entrepot nature.

### The Current Export Pattern

A relatively few commodities account for the bulk of exports. Rubber, the leading export item in our countries, leads the export list and has a substantial edge over tea, the number two commodity. The third ranking export commodity, rice, is largely an intraregional export with very little leaving the area. Two other tropical commodities—copra and cane sugar—both coming mostly from the Philippines, rank fourth and fifth.

The two commodities for which the Far East has been historically famous—spices and silk—now rank far down on the list in the 4th and 15th positions, respectively. Three of the leading commodities are exported by one country only: jute by Pakistan, cashews by India, and abaca by the Philippines. India's cashew exports however, are partly re-

exports of nuts originating in Africa.

Neither of the two leading commodities, which account for one-half of all agricultural exports, are food commodities. Only five items, representing one-third of the total on a value basis, may be considered as foodstuffs. This contrasts strongly with agricultural imports which are preponderantly foodstuffs.

### The Current Import Pattern

Three commodities—two of which, wheat and rice, are foodstuffs and one, cotton, an industrial commodity—comprise over one-half of all agricultural imports. Much of the rice imports come from surplus producing countries within the area. Less than one-tenth of the rice was supplied by the United States in 1958. Wheat, sugar, and dairy products are imported by virtual-

TABLE 21.—*Far East: Summary of principal agricultural exports by country and commodity, 1958<sup>1</sup>*  
 [Million dollars]

Country	Rubber	Tea	Rice	Coco-nuts <sup>3</sup>	Sugar	Jute	Tobacco	Cotton	Wool	Palm oil	Coffee	Ca-shews	Abaca	Spices	Silk	Total
Burma <sup>2</sup>	7.9	165.2	19.1	40.2	7.7	30.9	8.9	30.2	18.1	23.7	15.1	32.6	18.5	1.6	178.4	
Cambodia <sup>2</sup>	16.3	237.5	54.2	286.7	20.9	1.1	1.1	3.1	18.1	18.1	23.7	15.1	32.6	18.5	37.0	
Ceylon	54.2	24.8	24.8	4.6	15.7	170.2	116.2	163.9	7.9	6.7	21.7	15.5	28.5	7.7	331.9	
India	261.2	391.1	5.1	6.4	26.4	80.8	80.8	4.1	4.1	4.1	4.1	4.1	4.1	4.1	441.5	
Indonesia	261.2	391.1	5.1	6.4	142.5	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	395.5	
Japan	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Korea, South	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Malaya, Fed. of	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Pakistan <sup>2</sup>	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Philippines	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Taiwan	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Thailand	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Vietnam, South	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	391.1	
Total	829.1	565.1	367.1	247.0	214.7	163.9	76.2	43.9	39.8	39.2	33.2	32.6	28.5	29.8	23.0	2,733.1

<sup>1</sup> This table includes about 90 percent of all agricultural exports of the countries listed.

<sup>2</sup> Data for 1957.

<sup>3</sup> Includes coconut products.

<sup>4</sup> Sugarcane.

**Note.**—This table is compiled from summary tables of individual countries and is not therefore all inclusive. Blank spaces do not mean no exports but only that the commodity is minor in that country's trade.

TABLE 22.—*Far East: Selected agricultural export trade relationships, by value, by country in 1958*

Country	Total exports	Agricultural exports	Agricultural share of total exports	Principal agricultural export	Percent principal agricultural export of total exports	Per capita agricultural exports
	Million dollars	Million dollars	Percent	Commodity	Percent	Dollars
Burma <sup>1</sup> .....	227.1	2197.4	87	Rice.....	73	9.75
Cambodia <sup>1</sup> .....	51.4	47.9	93	Rice.....	37	10.19
Ceylon.....	359.2	342.4	95	Tea.....	66	36.47
India.....	1,198.1	536.2	45	Tea.....	24	1.35
Indonesia.....	755.4	413.8	55	Rubber....	35	4.74
Japan.....	2,876.6	271.6	2	Silk, raw....	1	.78
Korea, South.....	16.4	2.4	15	Silk, raw....	4	.11
Malaya, Fed. of.....	615.3	452.3	74	Rubber....	64	69.40
Pakistan <sup>1</sup> .....	336.7	214.1	64	Jute.....	49	2.50
Philippines.....	459.8	336.9	73	Copra....	27	14.03
Taiwan.....	155.8	129.7	83	Sugar.....	52	13.16
Thailand.....	297.3	242.2	81	Rice.....	48	11.28
Vietnam, South...	55.0	51.3	93	Rubber....	64	3.89

<sup>1</sup> For calendar year 1957.

<sup>2</sup> Total of principal agricultural exports only.

by every country. Tobacco, cotton, and rice are imported by most of the countries. Annual net food grain imports, mostly wheat, now approach the combined food grain production of Burma and Thailand.

Japan, needing agricultural industrial commodities — cotton, wool, rubber—to supply its burgeoning industrial complex, accounts for about 40 percent of all agricultural imports. The cotton and wool come mostly from outside the area, but all the rubber is produced within the area.

### Trade With the United States

**Exports to U.S.**—For the past decade the United States has imported about \$4 billion worth of agricultural commodities per year. On the average one-sixth of this quantity or about \$700 million worth comes from the Far East. Rubber usually accounts for one-third of this total and sugar and copra another third.

Next in importance are tea, cashews, spices, and silk. With few exceptions, these imports are tropical crops and cannot be produced in the United States.

Some seven countries ship rubber to the U.S., but two countries—Indonesia and Malaya—supply the greater part. Several of the other leading commodities are supplied almost entirely by one country. The Republic of the Philippines is the only sizable supplier of abaca, copra, and sugar. Cashews come from India, jute from Pakistan, silk from Japan, and tapioca from Thailand. Spices are largely, but not entirely, supplied by Indonesia.

The Republic of the Philippines leads the list of supplying countries and is followed by Indonesia, Thailand, India, and Malaya. Several countries, namely Burma, Laos, Cambodia, South Korea, South Vietnam, and Taiwan send only nominal quantities of agricultural commodities to the United States.

TABLE 23.—*Far East: Summary of principal agricultural imports by country and commodity, 1958*<sup>1</sup>  
 [Million dollars]

Country	Wheat <sup>2</sup>	Cotton raw	Rice	Wool	Sugar	Dairy products	Rubber	Soy-beans	Fruits and vegetables	Barley	Corn	Tobacco	Total
Burma <sup>3</sup>	1.0	.....	49.9	41.9	8.3	2.8	11.2	.....	1.2	.....	.....	0.8	16.0
Cambodia <sup>3</sup>	14.1	.....	36.3	92.5	.....	1.0	1.6	.....	2.4	.....	.....	.7	6.7
Ceylon	.....	.....	.....	17.7	11.6	.....	.....	.....	11.8	.....	.....	4.6	105.1
Hongkong	.....	.....	.....	10.3	19.1	.....	.....	.....	43.5	.....	.....	4.6	164.0
India	215.6	64.3	88.0	.....	.....	9.7	6.5	.....	12.6	.....	.....	2.9	404.1
Indonesia	8.9	6.2	340.3	72.5	189.8	120.6	6.7	.....	.1	.....	.....	3.8	114.0
Japan	154.2	31.7	340.3	9.1	6.8	72.2	90.8	.....	41.4	40.0	.....	.....	1,121.8
Korea, South	38.2	11.2	45.5	.....	22.0	17.7	24.2	.....	8.2	.....	.....	.....	110.6
Malaya, Fed. of	.....	.....	58.1	58.0	16.3	3.2	.....	.....	1.7	.....	.....	.....	128.8
Pakistan <sup>3</sup>	.....	.....	28.2	8.4	20.7	1.9	.....	27.3	.....	.....	.....	2.6	137.3
Philippines	.....	18.2	15.8	.....	.....	.....	1.6	2.2	9.9	.....	.....	2.6	87.2
Taiwan	3.7	4.5	.....	.....	.....	2.4	18.2	.....	.....	1.4	.....	8.6	49.6
Thailand	.....	.....	.....	.....	.....	5.0	8.2	.....	.....	.....	.....	2.7	32.9
Vietnam, South	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.7	21.8
Total...	555.9	503.0	469.0	209.1	205.2	137.9	109.6	100.7	82.9	59.9	40.0	26.7	2,499.9

<sup>1</sup> This table includes over 80 percent of all agricultural imports by the countries listed.

<sup>2</sup> Includes wheat flour.

<sup>3</sup> Data for 1957.

Note.—This table is compiled from summary tables of individual countries and is not therefore all inclusive. Blank spaces do not mean no imports but only that the commodity is minor in that country's trade.

TABLE 24.—*Far East: Selected agricultural import trade relationships, by value, by country, 1958*

Country	Total imports	Agricultural imports	Agricultural share of total imports	Principal agricultural import	Percent principal agricultural import of total imports	Per capita agricultural imports
	Million dollars	Million dollars	Percent	Commodity	Percent	Dollars
Burma <sup>1</sup> .....	296.5	230.9	210.4	Dairy products	3.8	21.53
Cambodia <sup>1</sup> .....	53.4	7.8	14.6	Vegetables and fruit	3.6	1.66
Ceylon.....	360.1	128.9	35.8	Rice.....	13.9	13.73
India.....	1,814.8	493.7	27.2	Wheat.....	11.9	1.24
Indonesia.....	513.5	124.6	24.3	Rice.....	17.1	1.43
Japan.....	3,033.1	21,240.4	240.9	Cotton, raw	11.2	213.52
Korea, South.....	378.2	123.9	32.8	do.....	8.4	5.51
Malaya, Fed of.....	541.2	211.3	39.0	Rice.....	8.4	32.43
Pakistan <sup>1</sup> .....	440.2	156.7	35.6	Wheat.....	13.2	1.83
Philippines.....	553.3	122.8	22.2	Wheat flour	5.1	5.11
Taiwan.....	226.2	251.8	22.9	Wheat.....	8.0	25.26
Thailand.....	395.4	239.1	29.9	Dairy products	4.6	21.82
Vietnam, South...	232.0	26.2	211.3	do.....	3.5	21.98

<sup>1</sup> For calendar year 1957.

<sup>2</sup> Total of principal agricultural commodities only.

TABLE 25.—*Far East: Value of total agricultural trade and agricultural trade with the United States by country, 1958*

Country	Agricultural exports		Agricultural imports	
	Total	To U.S.	Total	From U.S.
	Million dollars	Million dollars	Million dollars	Million dollars
Burma.....	1 2197.4	0.9	1 2 30.9	0.5
Cambodia.....	247.9	9.3	27.8	1.3
Ceylon.....	342.4	26.2	128.9	15.5
India.....	536.2	59.9	493.7	175.9
Indonesia.....	413.8	95.2	124.6	11.9
Japan.....	1 71.6	25.0	1 1,240.4	361.1
Korea, South.....	2.4	.8	123.9	110.8
Malaya, Fed. of.....	452.3	50.1	211.3	1.2
Pakistan.....	2 214.1	18.4	2156.7	65.3
Philippines.....	336.9	220.3	122.8	75.7
Taiwan.....	1 129.7	6.0	1 351.8	352.4
Thailand.....	1 242.2	53.5	239.1	8.3
South Vietnam.....	1 51.3	4.9	26.2	18.7
Total.....	3,038.2	570.5	2,758.1	898.6

<sup>1</sup> Total of principal agricultural commodities only.

<sup>2</sup> Figures for 1957.

<sup>3</sup> Agricultural imports from United States are complete but Taiwan's total imports include only major commodities. Nearly all of Taiwan's agricultural imports, however, are from the United States.

TABLE 26.—*Far East: Summary of principal U.S. agricultural imports by commodity and country of origin, 1958<sup>1</sup>*  
 [Million dollars]

Country	Rubber	Sugar	Copra <sup>2</sup>	Tea	Cashews	Silk	Spices	Wool	Abaca	Jute	Goat Skins	Tapioca	Total
Afghanistan	9.3	...	0.1	18.9	...	...	...	1.0	...	...	...	...	1.0
Cambodia	5.9	...	...	15.2	...	...	0.6	...	...	...	...	...	9.3
Ceylon	...	...	...	15.5	24.1	...	...	2.0	4.9	...	4.3	...	25.5
Hongkong	...	...	...	6.0	...	...	10.7	...	...	...	3	...	50.8
India	...	...	...	1.0	...	14.5	...	...	...	...	...	...	90.5
Indonesia	73.5	...	...	...	...	6	...	...	...	...	...	...	15.5
Japan	...	...	...	...	...	...	...	7.2	10.7	7.7	1.6	...	49.6
Korea, South	49.3	...	...	...	...	...	...	...	...	...	...	...	49.3
Malaya, Fed. of	...	...	...	...	...	...	...	7	...	...	...	...	16.5
Pakistan	...	...	...	...	...	...	...	...	...	...	...	...	211.2
Philippines	...	...	110.2	90.3	...	...	...	...	...	...	...	...	24.7
Singapore	24.0	...	...	...	...	...	...	...	...	...	...	...	1.6
Taiwan	...	...	...	...	1.6	...	...	...	...	...	...	...	52.1
Thailand	46.4	...	...	...	...	...	...	...	...	...	...	...	4.5
Vietnam, South	3.5	...	...	...	...	...	...	1.0	...	...	...	...	...
Total . . .	211.9	110.2	90.4	43.2	24.1	15.1	15.0	13.1	10.7	7.7	6.2	5.7	553.3

<sup>1</sup>The commodities included in this table accounted for about 92 percent of U.S. agricultural imports from the Far East in 1958.

<sup>2</sup>Also includes coconut products other than copra.

NOTE.—This table is compiled from summary tables of individual countries and is not therefore all inclusive. Blank spaces do not mean no imports but only that the commodity is minor in that country's trade.

TABLE 27.—*Far East: Summary of principal U.S. agricultural exports by country of destination and commodity, 1958<sup>1</sup>*  
 [Million dollars]

Country	Wheat and flour	Cotton excl. linters	Soy-beans	Dairy products	Rice	Barley	Tobacco	Tallow	Corn	Hides and skins	Fruits	Grain sorghums	Vegetables	Food for relief or charity	Total
Ceylon...	5.1	13.0	0.2	7.4	0.6	1.5	0.4	0.6	0.4	0.4	0.4	0.4	0.4	2.1	15.8
Hongkong.....	1.3	11.4	3.2	5.4	4.8	2.9	1.2	3.4	2.4	2.4	2.4	2.4	2.4	2.4	21.6
India.....	142.6	4.5	68.8	4.4	21.2	10.4	18.8	18.3	13.3	1.0	2.3	2.3	2.3	8.7	175.5
Indonesia.....	70.9	117.4	32.5	6.3	13.1	14.1	2.1	1.6	1.4	.2	.2	.2	.2	.7	11.5
Japan.....	31.7	1.6	1.6	2.1	1.4	1.1	2	3	1.1	1.1	1.1	1.1	1.1	1.1	348.3
Korea, South.....	45.2	18.9	11.6	.2	19.5	8.4	.1	2.8	1.1	1.1	1.1	1.1	1.1	1.1	105.2
Pakistan.....	14.8	17.2	9.1	.2	3	2.3	2.3	1.8	1.8	.3	.3	.3	.3	.6	64.6
Philippines.....	2.2	2.3	2.3	7.9	7.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1	7.2
Singapore.....	14.8	17.2	9.1	.3	3	2.3	2.3	1.8	1.8	.3	.3	.3	.3	.6	2.3
Taiwan.....	2.2	2.3	2.3	7.9	7.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1	50.3
Thailand.....	2.3	2.3	2.3	7.9	7.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1	3.8
Vietnam, South.....	2.3	2.3	2.3	7.9	7.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1	16.7
Total.....	333.2	209.4	84.4	39.8	35.3	34.4	31.2	23.6	23.1	13.8	5.7	5.7	5.6	4.0	887.6

<sup>1</sup> The commodities included in this table account for 96 percent of U.S. agricultural exports to the countries listed.  
 NOTE.—This table is compiled from summary tables of individual countries and is not therefore all inclusive. Blank spaces do not mean no exports but only that the commodity is minor in that country's trade.

**Imports From U.S.**—About one-fourth of the agricultural commodities leaving U.S. shores are destined for the Far East. Wheat and flour lead the list followed by cotton. Together these items comprise two-thirds of the total. Soybeans, a relatively new but rapidly growing export, are in third place well above any other commodities. If all grains—wheat, rice, barley, corn, and sorghum grains—are considered aggregate-ly, they represent nearly one-half of all agricultural exports to the area. A handful of commodities—dairy products, wheat and flour, tobacco and cotton—are exported in some volume to almost every Far Eastern country.

Total U.S. agricultural exports to the Far East average just over \$1 per capita for the over 800 million inhabitants of the Free Far East countries. Japan, the leading U.S. world market for the past decade, takes over one-third of U.S. agricultural exports to the area. Both India and Pakistan are important and rapidly expanding markets. A handful of countries—Afghanistan, Burma, Malaya, Thailand, and Cambodia—import only very small, in some

cases negligible quantities of U.S. farm products.

Unlike exports to the United States, which are largely agricultural industrial commodities, imports from the United States are largely foodstuffs. Their own agriculture cannot adequately provide for the increasing level of consumption.

U.S. exports to the area may be divided into two categories—dollar sales and local currency sales. Many countries have chronic balance of payment problems and are unable to purchase needed goods for dollars. Under Public Law 480, enacted in 1954, provision is made for the sale of surplus U.S. agricultural commodities for foreign currencies. In prosperous countries such as Japan where gold and dollar holdings are ample, purchases are made with dollars. In less fortunate countries, requiring large amounts of foreign exchange to finance heavy machinery imports for industrialization while simultaneously needing to satisfy the food and fiber needs of a growing population, foreign currency purchases have been an indispensable aid. India, Pakistan, South Korea, Taiwan,

TABLE 28.—*Far East: U.S. agricultural exports under title I, Public Law 480 and total, by country, 1958*

Country	Title I	Total
	<i>1,000 Dollars</i>	<i>1,000 Dollars</i>
Afghanistan.....		1,790
Burma.....	283	544
Ceylon.....	5,214	15,500
Hong Kong.....		25,304
India.....	149,442	175,949
Indonesia.....	6,145	11,935
Japan.....		361,100
Korea, South.....	42,731	110,835
Pakistan.....	57,923	65,295
Philippines.....	7,628	75,695
Taiwan.....	10,803	52,366
Thailand.....	407	8,266
Vietnam, South.....		18,700
Total.....	280,576	923,279

and Indonesia have been the major beneficiaries of foreign currency sales.

### Competition With the United States

Of the 15 leading agricultural commodities entering world commerce from the Free World countries, only 3—rice, cotton and tobacco—can be considered competitive with U.S. products. Very little rice leaves the Far East, however, as the region is a net importer of rice. Most of the cotton exported is of a short staple type and hence not particularly competitive with varieties grown in the United States. Tobacco exports, not large to begin with and principally of different type and quality, often go to destinations within the area.

Mainland China, with its similar temperate climate, is the greatest source of competition. China is the only other important world exporter of soybeans, and competition is particularly keen in the West European market. A current disagreement between Japan and Mainland China makes the United States the only important soybean supplier in the Japanese market.

About one-half of the agricultural products coming into the United States from all areas of the world tend to compete with domestically produced commodities. Virtually all the agricultural commodities coming from the Far East, however, are of a tropical nature and hence fall into the non-competitive half of U.S. agricultural imports.

### Hong Kong and Singapore: Entrepot Markets

Hong Kong and Singapore produce very little food or fiber but they play a major role in Far Eastern agricultural trade as brokerage points. A sizable part

of the raw materials produced in Southeast Asia, particularly rubber, enters into world markets via Singapore. Singapore, with a population of 1.5 million, and Hongkong with nearly 3 million, are both important as end markets as well, for their food and fiber needs are largely satisfied by imports.

Light industry, much of it based on the processing of imported farm commodities, provides a means of livelihood for a large part of Hongkong's 3 million people. The flourishing Hongkong textile industry is becoming one of the most important textile centers in the area. Many of the residents of both Hongkong and Singapore are engaged in commerce, either directly as merchants or as laborers employed in the handling, storing, and redistribution of goods.

### Gold and Foreign Exchange Holdings

Some few Far Eastern countries, such as Japan and Thailand, enjoy a favorable balance of payments, but most have a chronic balance of payments problem. American aid, of one sort or another, helps many countries to maintain a reasonable equilibrium. Foreign currency sales of agricultural commodities under Public Law 480 have been of invaluable assistance to some countries in maintaining at least a minimum workable level of gold and foreign exchange holdings. In other, less fortunate countries, foreign currency sales alone have not been enough and the direct infusion of American capital in the form of dollar aid has been required. Those countries supporting heavy defense establishments—South Korea, Taiwan, and South Vietnam—have been particularly needful of American assistance.

India too has required increasing dollar assistance in recent years. Several leading western powers other than the United States have also assisted India with financial aid during these years.

Total holdings of gold and foreign exchange for all countries considered aggregately have not changed greatly in the past decade except during the recession of 1957-58. In terms of individual

countries, however, some significant changes have taken place. Japan with its highly productive economy has increased its holdings from just under \$1 billion in 1952 to nearly \$2 billion in 1960. India, pressed by the need for imported heavy machinery in order to industrialize has steadily lost gold and foreign exchange with total holdings going from nearly \$2 billion at midcentury to only \$670 million in December 1960.

## Food Consumption

### Levels of Consumption

Only a few countries in the Far East are assured of an abundant and reliable food supply from their own agricultural resources. On the basis of food balances calculated for all the major Free World countries in the area, per capita consumption averages about 2,100 calories per day. The level of intake as a whole is well below that of other regions including Africa and the Middle East. Calorie intake levels in the United States, usually ranging from 3,100 to 3,200 calories daily, are about 50 percent above those of the Far East. A direct compar-

ison cannot be made, however, as food requirements of the physically smaller inhabitants of the area are somewhat less than for other peoples of the world.

Recommended minimum levels of consumption for the various countries average about 2,300 calories per capita daily for the region. Only three countries—Japan, Taiwan, and Malaya—approach or exceed the minimum recommended levels. Consumption levels for the region are edging upward but it will likely be several years before even the minimum recommended levels are attained. Food availability will in-

TABLE 29.—*Far East: Gold and foreign exchange holdings of selected countries, in millions of dollars, 1952-60*

Country	1952	1953	1954	1955	1956	1957	1958	1959	1960
Burma.....	208	225	142	118	145	106	137	156	141 (Dec.)
Ceylon.....	163	113	168	205	221	183	172	132	89 (Dec.)
India.....	1,796	1,862	1,867	1,866	1,435	942	722	814	670 (Dec.)
Indonesia.....	314	212	248	307	255	224	217	300	341 (Dec.)
Japan.....	979	823	738	769	941	524	861	1,322	1,824 (Dec.)
Korea, South....	83	109	108	96	99	116	146	147	157 (Dec.)
Malaya, Fed. of	278	270	291	315	324	328	353	450	479 (Nov.)
Pakistan.....	356	376	360	397	415	359	312	400	415 (Dec.)
Philippines <sup>1</sup> ....	324	304	266	268	294	181	186	181	218 (Dec.)
Taiwan.....	44	54	34	61	79	108	111	112	117 (Dec.)
Thailand.....	348	304	279	301	315	321	306	308	329 (June)
Total....	4,893	4,652	4,501	4,703	4,523	3,392	3,523	4,322	4,780

<sup>1</sup> Gold held by central bank and dollar assets reported by U.S. of Philippine Government and banks.

TABLE 30.—*Far East: Per capita annual food consumption levels by food groups for selected countries, 1958*

Country	Grain-products	Sugar	Roots and tubers	Pulses	Fruits, nuts, vegetables, <sup>1</sup>	Meat	Fish	Fats and oils	Whole milk	Eggs	Total	Calories*
Burma.....	166.1	9.9	2.4	10.0	89.0	4.2	25.9	4.3	18.0	4.8	2,150	
Ceylon.....	119.2	11.0	30.8	6.9	112.7	4.9	18.1	5.8	17.1	1.0	2,060	
India.....	138.3	12.7	30.4	23.1	66.3	1.4	6.1	5.0	32.8	.2	2,050	
Indonesia.....	120.9	11.4	144.7	12.1	229.3	2.3	8.7	5.4	.5	2.3	2,125	
Japan.....	156.3	14.6	78.6	13.1	94.6	4.1	40.0	3.6	14.4	4.0	2,130	
Korea, South.....	166.3	6.6	53.3	6.9	64.9	6.0	32.9	.7	2.7	2.0	2,040	
Malaya, Fed. of.....	146.7	15.8	16.8	7.5	119.4	9.0	19.4	7.1	18.5	4.9	2,290	
Pakistan.....	150.1	18.6	5.6	12.8	132.6	6.7	8.4	1.7	11.8	.3	2,030	
Philippines.....	131.1	13.3	44.4	7.9	187.4	10.3	23.8	4.2	12.9	3.0	2,145	
Taiwan.....	152.3	12.7	74.5	13.1	85.8	19.0	22.0	3.8	1.3	1.6	2,340	
Thailand.....	146.2	8.5	4.7	5.9	72.1	9.7	27.5	5.2	4.2	4.8	2,185	
Average.....	141.2	13.1	46.1	17.4	100.7	3.5	13.4	4.4	21.5	1.4	2,100	

<sup>1</sup> Including coconuts consumed fresh.  
\* Per day.

crease both from greater imports and higher indigenous production but much of the gains will be absorbed by population growth. At present, net imports of food grains into the area supply an average of 110 calories daily per capita for the over 800 million inhabitants of Free World countries. The share of total calories consumed which is produced outside the area is expanding steadily.

### Consumption Pattern

In most northern hemisphere countries of the western world, wheat is the staple food but throughout virtually all the Far East it is rice. Only in Afghanistan is rice supplanted by wheat as the leading staple. Wheat, a secondary food in many countries, contributes a sizable proportion of the total calories consumed in India, Ceylon, Japan, Malaya, Pakistan, Taiwan, South Korea, and Mainland China. Although wheat supplies a considerable number of calories in South Korea and in the Philippines it is relegated to third place by barley in Korea and corn in the Philippines. In Ceylon, a fruit—coco-nuts—outranks wheat as a supplier of calories and in India a vegetable category—pulses—is on a par with wheat as a source of energy.

The combination of taste preferences and availability is the major determinant of the consumption pattern in most of the world. In much of the Far East, however, another factor—religion—exerts a strong influence on food habits. India is largely a vegetarian society although non-bovine meat is eaten in many parts of the country. Some of the more orthodox Hindus resist eating eggs or drinking milk as eggs represent a potential form of life and milk is provided, they believe, only to sustain the young of an-

imals. Religious beliefs forbid Muslims to eat pork.

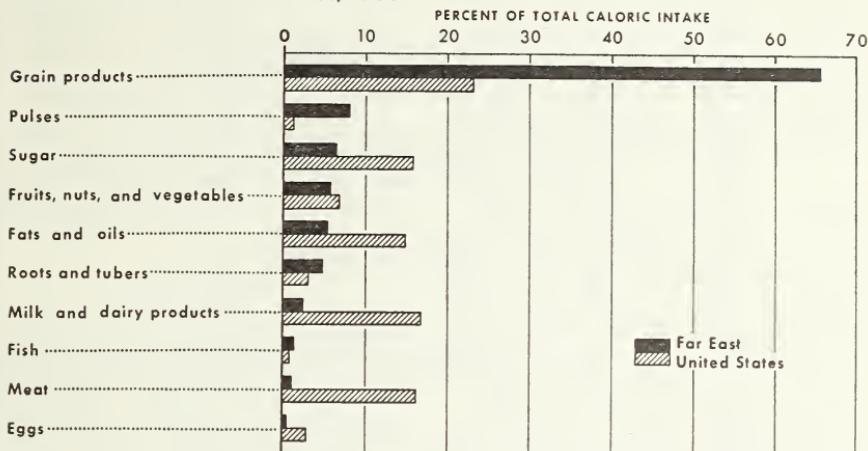
The consumption pattern of the Far East contrasts strongly with that of the United States. Over 65 percent of the caloric content of the Far Eastern diet is contributed by food grains but in the United States food grains supply less than one-fourth of all calories. Meat, milk, and dairy products provide over one-third of all calories consumed in the United States, but only 3 percent in the Far East. In the case of only one animal protein food—fish—is consumption in the area higher than that of the United States. The consumption of sugar and fats and oils—foods associated with a high standard of living—is three times greater in the United States (fig. 6).

### The Shifting Consumption Pattern

Although complete data on food consumption over an extended period of time are not available, it is nonetheless possible to observe some of the more obvious shifts currently taking place in the consumption pattern. The production pattern has remained quite steady for the past quarter century, but the area, a net exporter of food grains just prior to World War II, is now a net importer of 10 million tons of food grains, largely wheat, each year. The position of wheat then has increased relative to rice and other food staples.

Surveys conducted in some countries—principally Japan, India, and the Philippines—have provided information as to the income elasticities of demand for leading foodstuffs. Among food grains, either rice or wheat has had the highest income elasticity. Barley, other minor cereals, and roots and tubers have usually showed a very low income elas-

**FAR EAST: Food Consumption Pattern Compared  
With That of the United States, 1958**



U. S. DEPARTMENT OF AGRICULTURE

NEG. ERS 191-61 (5) ECONOMIC RESEARCH SERVICE

**Figure 6**

ticity of demand and in some cases the coefficient has even been negative. In those instances, as incomes rise consumption will not only drop relative to other components of the consumption patterns, but it will also decline on an absolute per capita basis as well. Historically, the consumption of potatoes in the United

States has behaved in a similar fashion.

Other pronounced shifts are also evident; demand for all animal products is rising sharply; fruit consumption is trending upward as is the consumption of fats and oils, though at a more modest rate.

### Agriculture in the Future

Any discussion of the future of agriculture in the Far East must of necessity focus on the relationship between the demand for food and fiber and the agricultural production potential.

#### Consumption

The Far East is unique among the regions of the world in that it is the only major region with both a high rate of growth and an already dense population. Population increases 2 percent per year and in order to maintain the currently low consumption levels, production must consistently increase at least 2 percent annually. At this rate, Mainland China

faces the prospect of feeding an annual addition of 12-15 million or, stated otherwise, an annual addition equivalent to the current population of Australia. Even allowing for some reduction in growth rates, the regional increase between 1960 and 1975 will easily outnumber the current population of the Western Hemisphere.

Rising income levels represent the second major determinant of demand. During the 5-year interim between the beginning of 1955 and the end of 1959, per capita incomes rose about 2 percent annually in the Free World countries. Figures are not avail-

TABLE 31.—*Far East: Percentage distribution of food consumption in calories by food groups for selected countries, 1958*

Country	Grain-products	Sugar	Roots and tubers	Pulses	Fruits, nuts, vegetables <sup>1</sup>	Meat	Fish	Fats and oils	Whole milk	Eggs	Percent
Burma.....	76.0	4.7	0.2	4.4	4.2	1.2	2.1	4.9	1.4	0.9	
Ceylon.....	57.0	5.6	4.1	4.4	17.5	1.0	1.5	7.0	1.7	0.2	
India.....	65.1	6.3	2.9	11.0	4.0	0.2	0.5	6.3	3.7	(2)	
Indonesia.....	55.8	5.4	12.9	5.9	12.0	0.7	0.7	6.1	(2)	0.5	
Japan.....	66.7	6.7	8.2	5.0	3.5	1.1	3.0	4.1	1.1	0.6	
Korea, South.....	79.7	2.7	5.6	3.4	2.5	1.7	2.7	1.0	2.2	0.5	
Malaya, Fed of.....	63.3	7.2	2.0	3.5	8.7	2.2	1.5	7.6	3.1	0.9	
Pakistan.....	73.0	8.9	0.7	5.9	5.9	1.2	0.7	2.2	1.5	(2)	
Philippines.....	60.3	6.5	5.8	3.5	12.6	3.0	1.9	4.7	1.2	0.5	
Taiwan.....	64.5	5.8	8.5	6.0	3.0	6.2	1.5	4.1	0.2	0.2	
Thailand.....	65.9	3.9	0.5	2.7	10.3	3.0	6.2	5.7	0.9	0.9	
Average.....	65.9	6.3	4.6	8.0	5.6	0.9	1.2	5.3	2.3	0.3	

<sup>1</sup> Including coconuts consumed fresh.

<sup>2</sup> Less than 0.05 percent.

able for the Communist countries but it would not be unreasonable to expect that per capita incomes have risen at a comparable rate. For the region as a whole, well over one-half of personal income is spent for food. This relationship is a rather stable one and any increases in income will be likely reflected in greater demand for food.

### Production

The area of cultivable land in the Far East is limited and the availability of per capita cultivable land will most certainly decline in the years and decades ahead. In some individual coun-

tries the cultivable area is already on the decline. Unlike the relatively underpopulated continents of Africa and South America, the Far East, with centuries of habitation and the accompanying relentless exploitation of land, has little additional land available for reclamation.

The second factor of production—labor—is in abundant supply throughout the region and there is little reason to believe that any additions to the existing supply of agricultural labor would appreciably expand production.

Given the limited opportunity for expanding the cultivated area and the negligible effect of in-

TABLE 32.—*Far East: Per capita cultivated land in 1959 and projected to 1975*<sup>1</sup>

Countries	1959	1975
Free World countries:		
Afghanistan.....	0.45	0.36
Burma.....	1.11	0.83
Cambodia.....	0.81	0.61
Ceylon.....	0.37	0.26
India.....	0.84	0.60
Indonesia.....	0.49	0.36
Japan.....	0.14	0.11
Korea, South.....	0.21	0.15
Laos.....	0.81	0.77
Malaya, Fed. of.....	0.82	0.54
Nepal.....	0.94	0.66
Pakistan.....	0.65	0.44
Philippines.....	0.57	0.41
Taiwan.....	0.23	0.15
Thailand.....	0.87	0.59
Vietnam, South.....	0.51	0.28
Average.....	0.66	0.48
Asian Communist countries:		
China, Mainland.....	0.41	0.31
Korea, North.....	0.64	0.47
Vietnam, North.....	0.32	0.23
Average.....	0.41	0.31
Average for Far East.....	0.55	0.40

<sup>1</sup> Because of insufficient data, no allowance is made for potentially reclaimable land in 1975—it is realized that most countries will increase their agricultural area while others are certain to lose some. U.N. medium assumption population projection figures are used in the 1975 calculations.

creases in the labor supply, greater production can be achieved only by raising output per acre—by raising yields. Two means of raising yields are available—the adoption of improved practices (better management) and an intensification of capital inputs per acre. Management and capital then are the important variables, for inputs of the other factors of production—land and labor—will not change appreciably. The responsibility of adopting new practices and employing larger capital inputs must ultimately rest with the entrepreneur, in most cases the peasant.

Capital inputs take many forms such as fertilizer, irrigation, pesticides, improved seed, and better tools. Although all capital inputs are important, fertilizer and irrigation represent the greatest areas of potential production increase.

The potential for multiple cropping has not been exploited in most countries but it is likely that many countries can approach or even exceed the multiple cropping index of 2.0 recently achieved in Taiwan. As population grows and the cultivable land remains rather constant the index of multiple cropping will undoubtedly move upward.

Almost all countries in the region have development plans in the agricultural sector. Many of the multiyear plans are admittedly optimistic as several factors hinder the attainment of predetermined goals. Principal among such factors are a lack of sufficient investment capital, low literacy rates—particularly in the rural sector—soils badly depleted by centuries of over-cultivation, and a lack of managerial ability. Most countries, as part of their multiple-year long range plans, have as a stated goal, self-sufficiency in food production. Care must be taken to distinguish be-

tween food self-sufficiency and agricultural self-sufficiency. All countries except three are usually agriculturally self-sufficient (agricultural exports exceed agricultural imports) but most are not self-sufficient in food production.

Production is likely to make greater gains on the Indian subcontinent than in some of the remaining area. This will come about as a result of currently greater unrealized agricultural potential in this area and the infusion of relatively large amounts of capital into the agricultural sector of India. Pakistan, with its densely populated eastern province and arid western province, is likely to be hard-pressed to achieve any production gains on a per capita basis. In Ceylon, a rate of natural increase in population approaching 3 percent annually, will pose a formidable barrier to gains in per capita farm output.

Past rates of production increase in Japan and Taiwan, where agriculture is advanced and yields are among the highest in the world, are not likely to be maintained indefinitely in the years ahead. The agricultural potential in the more sparsely populated countries of Burma, Thailand, Laos, Cambodia, and South Vietnam will probably be realized slowly inasmuch as increased commercial export demand for their principal commodity—rice—is also likely to grow slowly. In Indonesia, farm output will not likely outdistance increases in population. Present low yields in the Philippines are expected to rise at a rate only slightly faster than the rate of population expansion.

Essential to the attainment of planned increases in output in all countries, is the continuance of outside financial and technical assistance. Even though this assistance may expand, it will of necessity be spread thinly among

the 100 million or more farmers in the Free World countries.

The future prospects of agriculture in the Far East Communist countries are somewhat less promising than in the Free World countries. This arises principally from two factors—the current per capita availability of agricultural land is much lower than in the Free World countries and the rate of natural increase is somewhat higher. In addition, the exploitation of agricultural production potential via noncapital input means has been much greater in China than in much of the rest of the Far East. This means that substantial gains in production can come about only as a result of increased capital inputs.

Current Communist policy of giving first priority to industrial development coupled with the general low level of economic activity,

however, limit the amount of capital available for investment in the agricultural sector. And equally or even more significantly the Communist system tends to destroy the initiative and incentive of farmers.

Social, psychological, and institutional changes of the magnitude needed to reach planned levels of production are considerable, and reluctance to change on the part of the peasants may well prove the most formidable barrier. It would seem that Far Eastern agriculture will be hard pressed to maintain the current consumption levels. The existing gap between production and consumption will likely continue and even expand in the years ahead. Any immediate widespread improvement in the diet will not be possible from indigenous resources.

### Future Trade Prospects

Although efforts at expanding the production of food in most countries have met with at least moderate success, it appears that the existing regional deficit will continue and probably grow in the years ahead. It also seems quite likely that temperate North America and Australia will continue to produce most of the food grains imported into the area. These countries—the United States, Canada, and Australia—with their sparse populations and vast resources in the form of land, agricultural technology, and production capital are likely to continue to produce sizeable surpluses. In addition, concerted large-scale efforts at raising the nutritional levels of the people in the underdeveloped countries may also serve to accelerate the current flow of foodstuffs into the area.

Deficits of the agricultural commodities now in undersupply in

the area—food grains, feed grains, and cotton—are likely to increase during the next decade. At present, exports of fats and oils, mostly coconut oil, more than offset imports but this situation is likely to be reversed by 1970. Rising feed grain imports will be absorbed mostly by Japan where the development of substantial livestock, dairy, and poultry industries is being based largely on imported feed grains. The development of textile industries, which usually characterizes the early stages of industrialization, will expand the demand for raw cotton faster than indigenous cotton growers can accommodate.

As the end of the century approaches, the food deficit in the area will likely be greater. Many more countries will have reached the saturation point in respect to the number of people the available land will sustain. Japan is well past the point at which the

land can support the people, and in spite of its success in raising yields, it can produce only about 80-85 percent of domestic food requirements. As other countries reach this point, they will come to depend more and more on outside sources of supply.

In summary, the gap between consumption and the capacity to produce will continue to grow in the Far East. The reverse will likely be true in temperate North America and Australia, for in

these areas the gap between the capacity to produce and the capacity to consume is widening. With regard to the availability of land, labor, capital, and management, temperate North America and Australia have an overwhelming advantage over the Far East. The Far East has an advantage only in the supply of labor but even this advantage becomes relatively unimportant when the supply of the other three factors is so limited.

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